

REPORT ON THE CONSERVATION STATUS OF  
Silene spaldingii, A CANDIDATE THREATENED SPECIES

**TAXON NAME:** Silene spaldingii Wats.  
**Common Name:** Spalding's catchfly  
**Family:** Caryophyllaceae  
**States Where Taxon Occurs:** U.S.A., Montana, Idaho, Washington, Oregon; Canada, British Columbia  
**Current Federal Status:** USFWS Notice of Review, Category 2  
**Recommended Federal Status:** USFWS Notice of Review, Category 2  
**Author of Report:** Lisa Ann Schassberger  
**Original Date of Report:** 22 December, 1988  
**Date of Most Recent Revision:** N/A  
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## I. SPECIES INFORMATION

### 1. Classification and nomenclature.

#### A. Species.

##### 1. Scientific name.

a. Binomial: Silene spaldingii Wats.

b. Full bibliographic citation: Watson, S. 1875. Revision of the genus Ceanothus, and descriptions of new plants, with a synopsis of the western species of Silene. Proc. Am. Acad. 10: 333-350.

c. Type specimens: United States, probably from near Clearwater, Idaho Co., Idaho. Watson stated the type came from "on Clearwater in central Idaho, Spalding." The type itself bears the label "Clearwater, Oregon, Rev. Mr. Spalding." GH (Hitchcock and Maguire, 1947).

2. Pertinent synonyms: None.

3. Common name: Spalding's catchfly

4. Taxon codes: PDCAROU1S0 (Montana, Oregon and Idaho Natural Heritage programs); JN.L76 (Washington Natural Heritage Program); 5044 SILSPA, (U.S. Forest Service, Region 1)

5. Size of genus: Over 400 species, mostly of the North Temperate Zone, and especially abundant in Eurasia (Hitchcock et al., 1964).

#### B. Family classification.

1. Family name: Caryophyllaceae.

2. Pertinent family synonym: None.

3. Common names for the family: Pink Family, Carnation Family.

C. Major plant group: Dicotyledoneae.

D. History of knowledge of taxon: Silene spaldingii was first collected by Rev. Mr. Spalding prior to 1875. The exact location of collection is not known. The label states "Clearwater, Oregon";

however, authorities believe its origin to be on the Clearwater River in central Idaho (Hitchcock and Maguire, 1947). Populations are now known from Montana, Idaho, Oregon, and Washington. Also, one plant was observed in British Columbia, Canada in 1988.

Silene spaldingii was first collected in Montana by R.S. Williams (995) in 1894. The label reads "Columbia Falls." This site has been searched for, but has never been relocated, and it is likely that the population was lost as much of this area has been converted for agricultural use. A second collection by D. Lau (74-63) was made in the vicinity of Niarada in 1974. This site has also never been relocated (using the directions on the collection label), and the specimen is thought to be mislabeled.

In 1983, Peter Lesica, working under contract with the Montana Field Office of The Nature Conservancy, located a population on Wild Horse Island in Flathead Lake, and three populations in the vicinity of Niarada. In 1985 two additional populations were located in the Tobacco Valley. These latter sites are 160 miles to the north of the Wild Horse Island/Niarada populations.

In 1988, the Montana Natural Heritage Program was contracted by the U.S. Fish and Wildlife Service to conduct a status survey of Silene spaldingii in Montana (Project Agreement No. SE-5-P-1). Under subcontract, the author conducted field surveys on 18-29 July, 1988 in appropriate habitats from the Canadian border (Tobacco Valley) south to Arlee, Montana. Two new populations were discovered along the flanks of the Hog Heaven Range, ca. 5 miles east of Niarada. Additionally, a small subpopulation was added to the Tobacco Plains North site (008), and one plant was observed in Canada.

- E. **Comments on current alternative taxonomic treatments:** There are no known current alternative taxonomic treatments.
- 2. **Present legal or other formal status.**
  - A. **International:** None.
  - B. **National.**

1. United States.

- a. **Present designated or proposed legal protection or regulation:** Currently, Silene spaldingii is under notice of review for potential listing as a threatened species under the U.S. Endangered Species Act of 1973 (U.S. Department of Interior, 1985). Specifically, it is included in Category 2 (taxa for which information now in possession of the Service indicates that listing as a threatened or endangered species is possibly appropriate, but for which substantial data on biological vulnerability and threats are not currently known or on file to support listing).
- b. **Other current formal status recommendations:** Silene spaldingii is currently listed as "endangered throughout range" (global rank = G2) by The Nature Conservancy.
- c. **State.**

1. Montana.

- a. **Present designated or proposed legal protection or regulation:** None.
- b. **Other current formal status recommendations:** Silene spaldingii is currently listed as "critically endangered" in Montana (state rank = S1) by the Montana Natural Heritage Program (Shelly, 1988).
- c. **Review of past status:** The Montana Rare Plant Project (Lesica et al., 1984) recommended the status of S. spaldingii as threatened because of its limited distribution, and the threats posed by agricultural and grazing activities in the areas where the plant is located.

2. Idaho.

- a. Present designated or proposed legal protection or regulation: None.
- b. Other current formal status recommendations: Silene spaldingii is currently listed as "critically endangered" in Montana (state rank = S1) by the Idaho Natural Heritage Program. The Idaho Native Plant Society, in the Region 4, Sensitive Plant Program Handbook (U.S. Dept. of Agriculture, 1988), lists S. spaldingii as threatened or endangered throughout all or a significant part of its range.
- c. Review of past status: The Rare and Endangered Plants technical committee of the Idaho Natural Areas Council recommended the status of S. spaldingii as "treat as threatened" (= a status given where the taxon lacks adequate field study and data) (U.S. Dept. of Agriculture, 1981).

3. Oregon.

- a. Present designated or proposed legal protection or regulation: None.
- b. Other current formal status recommendations: Silene spaldingii is currently listed as "critically endangered" in Oregon (state rank = S1) by the Oregon Natural Heritage Program.
- c. Review of past status: Silene spaldingii was listed by the Oregon Natural Area Preserves Advisory Committee as 11b (= threatened or endangered throughout its range; known from only a few widely disjunct

populations) (Siddal *et al.*, 1979).

4. Washington.

- a. Present designated or proposed legal protection or regulation: None.
- b. Other current formal status recommendations: Silene spaldingii is currently listed as "endangered" in Washington (state rank = S2) by the Washington Natural Heritage Program.
- c. Review of past status: None known.

3. Description.

- A. General nontechnical description: Silene spaldingii is a tall, herbaceous perennial. From one to several stems arise from a woody caudex. These stems reach 8-24 inches in height, and bear 4-7 pairs of cauline leaves. The leaves are broadly lance-shaped, 2-3 inches in length and up to 0.5 inch in width. The foliage is lightly to densely covered with sticky hairs. Several to many flowers form the inflorescence. Flowers are arranged in a spiral, and positioned at right angles along the tips of stems. The outer floral leaves, which are fused for most of their length, form a flaring tube about 0.5 inch long. Ten distinctive veins run along the length of this tube. The claws of the petals are also about 0.5 inch long, with the actual petal blades only 0.08 inch long. Both the claw and blade are white with a greenish tinge. Four, and sometimes up to 6 very short petal-like appendages are attached inside and just below each blade. These are also greenish-white in color. This species blooms in Montana in July and early August. Later, small light brown, wrinkled seeds ripen within a capsule.
- B. Technical description: Villous-tomentose and more or less viscid-pubescent perennial from a simple or branched caudex, 2-6 dm. tall; cauline leaves 4-7 pairs, oblanceolate below to lanceolate above, 6-7 cm. long, 0.5-1.5 cm. broad, sessile and slightly connate; flowers several to many in a leafy and

usually compact cyme; calyx tubular-campanulate, about 15 mm. long at anthesis, becoming more nearly clavate-campanulate in fruit, 10-nerved; corolla white, the claw of the petals about 15 mm. long, not auriculate above, the blade very short, ovate, about 2 mm. long, entire to shallowly emarginate; appendages 4 (5 or 6), ovate-lanceolate, about 0.5 mm. long; carpophore about 2 mm. long, glabrous; styles 3; capsule 1-celled; seeds light brown, about 2 mm. long, corrugate-wrinkled and inflated. Chromosome number 2N=24 (adapted from Hitchcock et al., 1964).

- C. **Local field characters:** In Montana this species is usually found in swales or draws, often on north- to east-facing slopes. Similar in appearance to many of the more common Silene species, it is distinct from them by its sticky villous hairs, long calyx tube, and bilobate petals with 4-6 appendages. Vegetatively, Silene scouleri is similar to S. spaldingii; however, it has bilobate petals with only two appendages. Silene cseri also overlaps in range with S. spaldingii, however it is an annual species with long petal blades and the foliage is not often sticky pubescent. Silene douglasii is similar in appearance to this species but has more slender stems and leaves, and is rarely sticky pubescent (Dorn, 1984). According to Hitchcock and Maguire (1947), S. oregana is quite similar to S. spaldingii with respect to the flowers; however, the petal blade is deeply 4 lobed and much longer and narrower in this species.
- D. **Identifying characteristics of material which is in interstate or international commerce or trade:** No interstate or international commerce or trade is known.
- E. **Photographs and line drawings:** Figure 1, p. 7, is a copy of illustrations that accompanied the descriptions of this species Hitchcock et al., (1964), and Hitchcock and Maguire, (1947). The color slides are duplicates of those taken at the sites indicated by the three-digit occurrence numbers, p. 8. Additional slides of S. spaldingii and its habitat are housed at the office of the Montana Natural Heritage Program, Helena, Montana.

#### 4. Significance.

- A. **Natural:** In the words of Hitchcock and Maguire (1947), "(t)he viscosity of the plant, the long

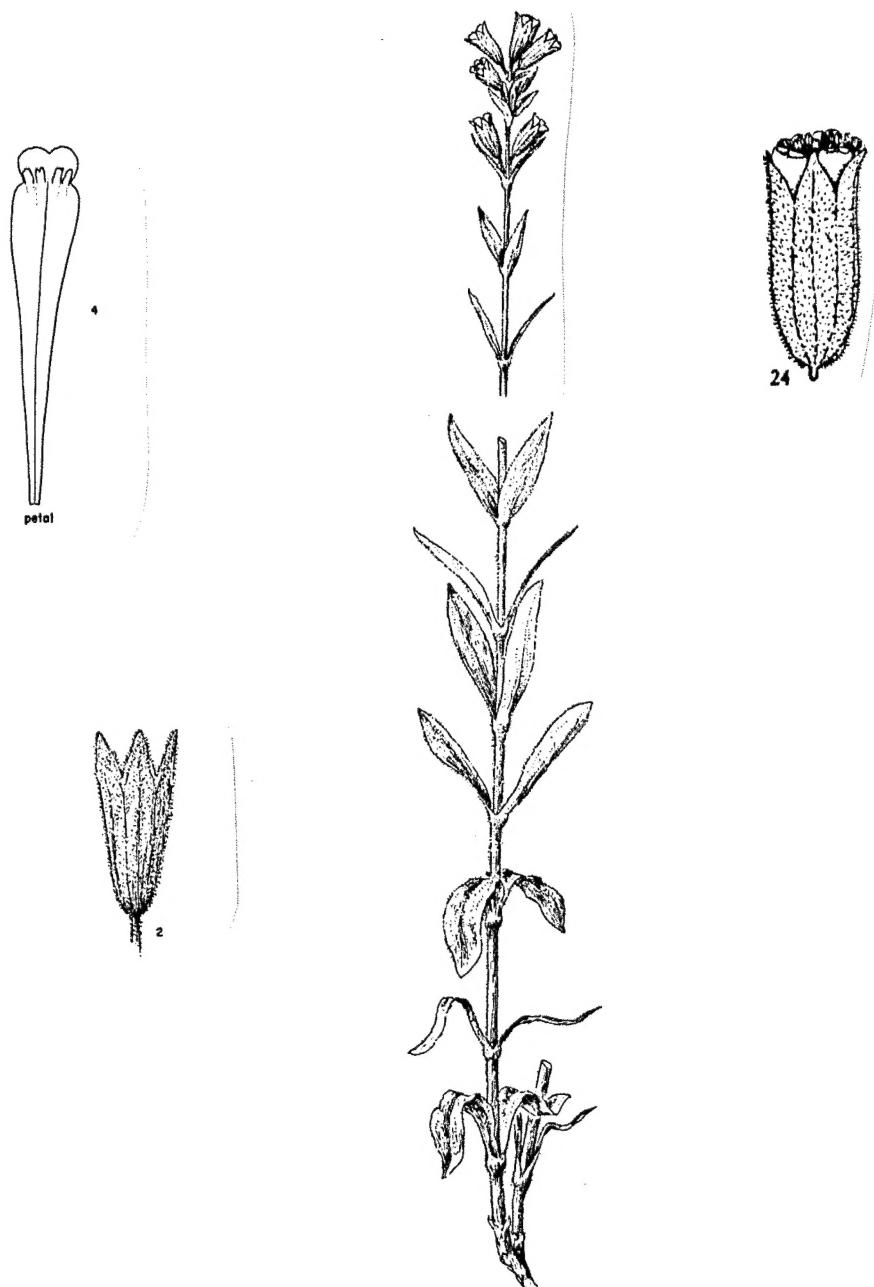
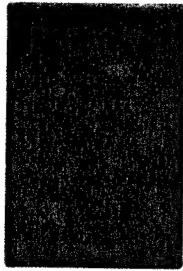
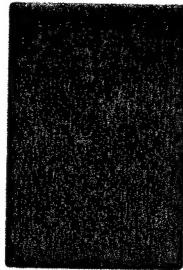


Figure 1. Line drawing of *Silene spaldingii*. Taken from Hitchcock et al. (1964) and Hitchcock and Maguire (1947).

Silene spaldingii 7/1983



Silene spaldingii 7/1983



Silene spald

981

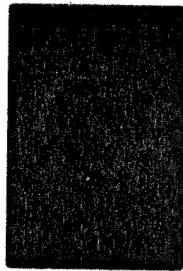
Wild Horse Island (002)  
State Park

Dancing Prairie  
Tobacco Plains S.  
(001)

8

Silene spaldingii 7/1988

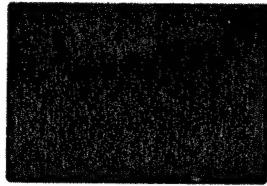
Lisa A. Schlossberger



Tobacco Plains North (008)

Silene spaldingii 7/1988

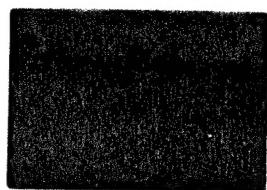
Habitat



Dancing Prairie  
Tobacco Plains S. (001)

Silene spaldingii 7/1988

Habitat

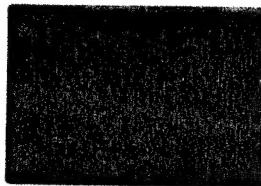


Tobacco Plains  
North (008)

Lisa A. Schlossberger

Silene spaldingii 7/1983

Habitat



Peter Lesica

Mill Pocket Ridge (004)

Silene spaldingii 7/1983

Habitat

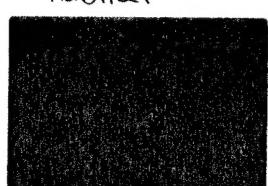


Peter Lesica

Crosson Valley (005)

Silene spaldingii 7/1988

Habitat

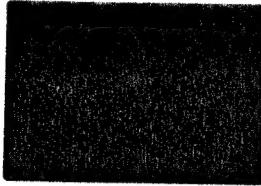


Lisa A. Schlossberger

981

Silene spaldingii 7/1983

Habitat



Peter Lesica

Crosson Valley (005)

calyx lobes, short blades of the petals, 4 shorter appendages, and large inflated seeds are almost peculiar to the species. All in all it is one of our most distinct plants . . ." This taxonomically distinct species is associated with the few remnants of Palouse prairie left intact in the states of Montana, Idaho, Oregon, and Washington.

- B. **Human:** According to Hitchcock *et al.* (1964), this family contains several genera of ornamental value, including Dianthus (carnation), Gypsophila (baby's breath), Arenaria (sandwort), Silene (catchfly), and Lychnis (campion). This species may have horticultural potential; however, currently it has no known agricultural, economic or other human uses or significance.

## 5. Geographical distribution.

- A. **Geographical range:** Silene spaldingii is currently known in Montana from sites in the Tobacco Valley, Lincoln County; Wild Horse Island, Lake County; and the area around Niarada in Sanders and Flathead counties. A distribution map of Silene spaldingii populations in Montana is found on p. 10. In Idaho it is known from sites in Lewiston County; and in Washington from sites in Whitman, Spokane, and Asotin counties. In 1988, a single plant was observed in British Columbia, Canada.

Silene spaldingii is historically known from two locations in Oregon in Umatilla and Wallowa counties.

## B. Precise occurrences.

### 1. Populations currently known to be extant.

- a. **Montana:** Populations are listed in Table 1, pp. 11-18. Exact locations are provided on USGS quadrangle maps, pp. 19-25.

Dancing Prairie-Tobacco Plains South (001)  
Wild Horse Island State Park (002)  
Black Bear Ranch (003)  
Mill Pocket Ridge (004)  
Crosson Valley (005)  
Tobacco Plains North (008)  
Cromwell Creek (009)  
Hog Heaven Range (010)

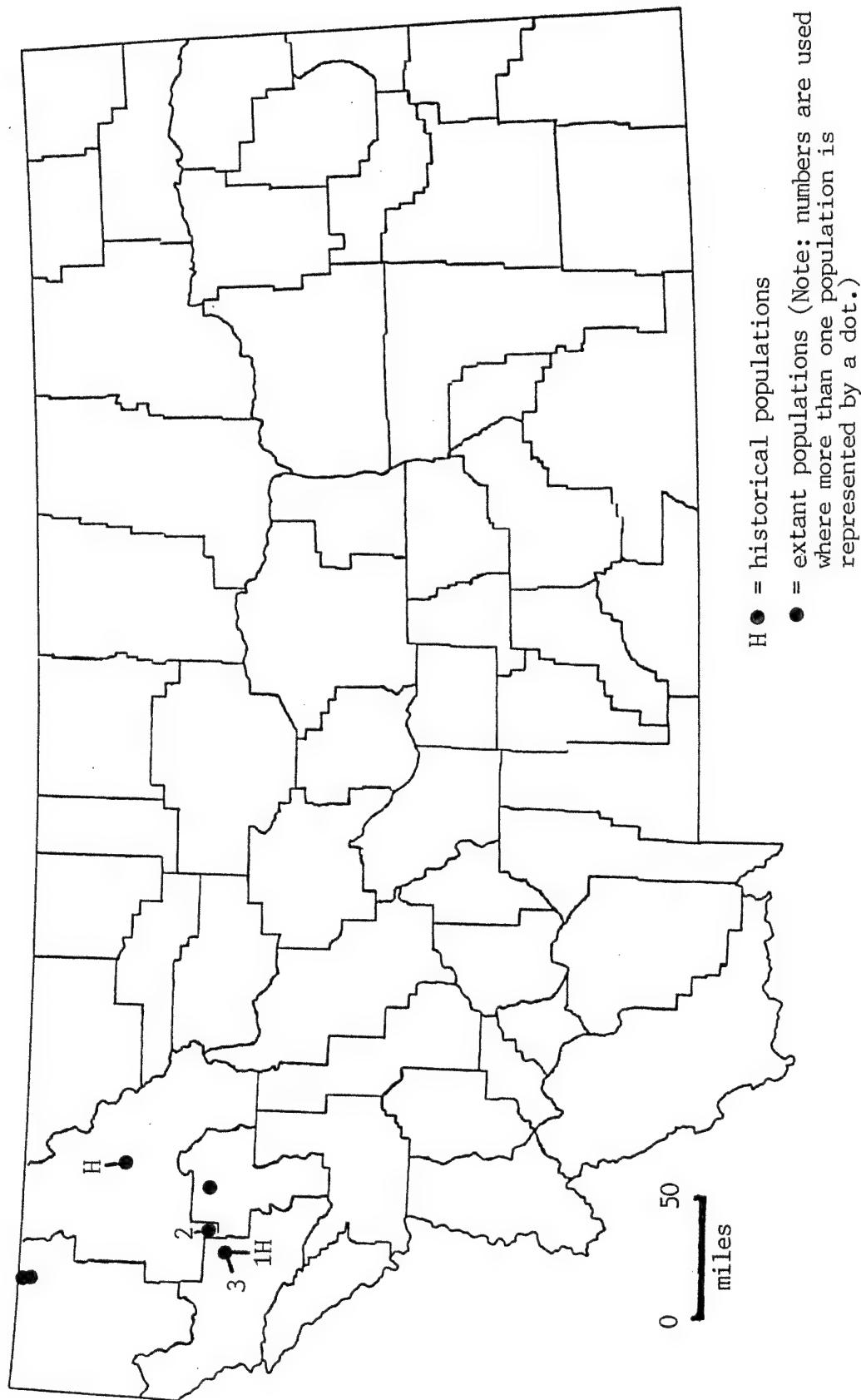


Figure 2. Distribution of Silene spaldingii populations in Montana.

## Montana

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.001  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 1 TENTEN: 4,4 IDENT: Y EORANK: A  
 SURVEYSITE: DANCING PRAIRIE-TOBACCO PLAINS SOUTH  
 EORANKCOMM:  
 SURVEYDATE: 1985-07-16 LASTOBS: 1988-07-18 FIRSTOBS: 1985 GRANK: 62  
 SRANK: S1 STATE: MT COUNTYNAME: MTLINC  
 QUADCODE: 4811581  
 QUADNAME: EUREKA NORTH PRECISION: SC  
 LAT: 485643 LONG: 1150440 S: 485627 N: 485733 E: 1150343 W: 1150458  
 TOWNRANGE: 037N027W SECTION: 26 MERIDIAN: PR TRSCOMM: N2,N2SW4,23E  
 2,24W2  
 PHYSPROV: NR WATERSHED: 17010101 RIVERREACH:  
 DIRECTIONS: TOBACCO PLAINS, CA. 3.5 AIR MILES NNW. OF EUREKA.

GENDESC: GENTLY ROLLING, GLACIATED PLAINS; UNIQUE GRASSLAND COMMUNITY  
 DOMINATED BY STIPA COMATA & FESTUCA SCABRELLA, WITH POA  
 SECUNDA; POA PRATENSIS IN SWALES; SILTY SOILS.

ELEV: 2720 SIZE: 200

EODATA: EST. 10,000 INDIVIDUALS, TWO SUBPOPULATIONS; "PERHAPS LARGEST POPULATION IN THE WORLD"; PRAIRIE IS IN VERY GOOD CONDITION, WITH LITTLE EVIDENCE OF SEVERE DISTURBANCE; SILENE OCCURS IN SWALES WHICH HAVE DEEPER, LESS GRAVELLY SOILS.

## COMMENTS:

MACODE1: PRIVATEOWNMTUS CONTAINED1: MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:

MOREMGMT: Z SITECODE:

SITENAME: DANCING PRAIRIE

OWNER:

OWNERCOMM:

PROTCOMM:

MGMTCOMM:

MONITOR:

MONITORNUM: -

BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT;  
 VOUCHER-LESICA, P. (3541), 1985, MONTU.

SOURCECODE: PNDLES01MTUS S85LESUMMTUS U85LES02MTUS PNDSHE01MTUS PNDSCH02MTUS

DATASENS: N BOUNDARIES: Y PHOTOS: N OWNERINFO:

TRANSCRIBR: 86-01-24 JSS CDREV: Y MAPPER: 86-01-24 JSS QC: Y

UPDATE: 88-12-02 LAS

Table 1. Occurrence records for extant populations in Montana.

## Montana

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.002  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 4 TENTEN: 3,3 IDENT: Y EORANK: A  
 SURVEYSITE: WILD HORSE ISLAND STATE PARK  
 EORANKCOMM:  
 SURVEYDATE: 1983-07-21 LASTOBS: 1983-07-21 FIRSTOBS: 1983 GRANK: G2  
 SRANK: S1 STATE: MT COUNTYNAME: MTLAKE  
 QUADCODE: 4711472  
 QUADNAME: WILD HORSE ISLAND PRECISION: SC  
 LAT: 475024 LONG: 1141309 S: 475013 N: 475036 E: 1141247 W: 1141318  
 TOWNRANGE: 024N020W SECTION: 18 MERIDIAN: PR TRSCOMM: W2  
 PHYSPROV: NR WATERSHED: 17010208 RIVERREACH:  
 DIRECTIONS: WILD HORSE ISLAND, IN FLATHEAD LAKE.  
  
 GENDESC: IN FESTUCA SCABRELLA/F. IDAHOENSIS/PSEUDOROEGERIA SPICATA  
           (AGSP) BUNCHGRASS PRAIRIE, WITH SCATTERED PINUS PONDEROSA;  
           NW-FACING SLOPES, GRAVELLY SILT-LOAM SOILS.  
 ELEV: 3200 SIZE: 10  
 EODATA: CA. 125-250 MATURE INDIVIDUALS IN 3 SUBPOPULATIONS; ISLAND  
           SUBJECT TO LIGHT GRAZING BY DEER, WILD HORSES (4), AND  
           BIGHORN SHEEP; ALSO, LIMITED RECREATION (HIKING).  
  
 COMMENTS: SEE EF FOR MAPS AND SITE SURVEY SUMMARY.  
  
 MACODE1: SFWSPWILD1MTUS CONTAINED1: Y MACODE2: FBIIRFLAT1MTUS CONTAINED2:  
         Y  
 MACODE3: CONTAINED3: ADLMAS: N MORELAN: MOREPROT:  
 MOREMGMT: Z SITECODE:  
 SITENAME: WILDHORSE ISLAND  
 OWNER:  
 OWNERCOMM:  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR: MONITORNUM: -  
 BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT;  
               VOUCHER-LESICA, P. (2755), 1983, MONTU.  
 SOURCECODE: PNDLES01MTUS S83LESUMMTUS U85LES02MTUS  
  
 DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:  
 TRANSCRIBR: 86-01-23 JSS CDREV: Y MAPPER: 86-01-24 JSS QC: Y  
 UPDATE: 88-12-02 LAS

Table 1. (cont.)

Montana  
ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.003  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 1 TENTEN: 7,7 IDENT: Y EORANK: C  
 SURVEYSITE: BLACK BEAR RANCH  
 EORANKCOMM:  
 SURVEYDATE: 1983-07-28 LASTOBS: 1983-07-28 FIRSTOBS: 1983 GRANK: G2  
 SRANK: S1 STATE: MT COUNTYNAME: MTSAND  
 QUADCODE: 4711476  
 QUADNAME: MILL POCKET CREEK PRECISION: SC  
 LAT: 474716 LONG: 1143953 S: 474711 N: 474720 E: 1143945 W: 1144000  
 TOWNRANGE: 023N024W SECTION: 03 MERIDIAN: PR TRSCOMM: NW4NW4  
 PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 1701021206500.00  
 DIRECTIONS: BLACK BEAR RANCH; W. FROM NIARADA CA. 2 MI.; HEAD W. AT  
                   CEMETERY; RD. TURNS S. IN 1/2 MI. AND FOLLOWS LITTLE  
                   BITTERROOT RIVER-GO 1 MI. S., SITE IS W. OF ROAD.  
 GENDESC: N. AND E.-FACING MESIC SLOPES & BOTTOMS OF DRAWS; SCATTERED  
                   PINUS PONDEROSA PRESENT, SLOPES DOMINATED BY FESTUCA  
                   IDAHOENSIS & F. SCABRELLA; BOTTOMS HAVE POA PRATENSIS.  
 ELEV: 2960 SIZE: 10  
 EODATA: 30 FLOWERING STEMS; AREA HAS BEEN DISTURBED, AND MANY EXOTIC  
                   SPECIES ARE PRESENT.

COMMENTS: SEE EF FOR MAPS AND SITE PRESERVE SUMMARY. VOUCHER-LESICA,  
                   P. (2766), 1983, MONTU.  
 MACODE1: PRIVATEOWNMTUS CONTAINED1: ? MACODE2: PNCRSBLAC1MTUS CONTAINED2:  
                   ?  
 MACODE3: FBIIRFLAT1MTUS CONTAINED3: Y ADLMAS: N MORELAN: MOREPROT:  
 MOREMGMT: Z SITECODE:  
 SITENAME: BLACK BEAR RANCH SITE  
 OWNER: GEIGER  
 OWNERCOMM: BLACK BEAR RANCH, NIARADA, MT.  
 PROTCOMM: TNC REGISTERED SITE NO.309  
 MGMTCOMM:  
 MONITOR: MONITORNUM: -  
 BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT.  
 SOURCECODE: PNDLES01MTUS S83LESUMMTUS U85LES02MTUS  
 DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:  
 TRANSCRIBR: 86-01-23 JSS CDREV: Y MAPPER: 86-01-24 JSS QC: Y  
 UPDATE: 87-02-05 JSS

## Montana

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U150.004  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 2 TENTEN: 7,6 IDENT: Y EORANK: C  
 SURVEYSITE: MILL POCKET RIDGE  
 EORANKCOMM:  
 SURVEYDATE: 1983-07-27 LASTOBS: 1983-07-27 FIRSTOBS: 1983 GRANK: G2  
 SRANK: S1 STATE: MT COUNTYNM: MTSAND  
 QUADCODE: 4711476  
 QUADNAME: MILL POCKET CREEK PRECISION: SC  
 LAT: 474758 LONG: 1143958 S: 474752 N: 474804 E: 1143948 W: 1144009  
 TOWNRANGE: 024N024W SECTION: 34 MERIDIAN: PR TRSCOMM: NW4,33NE4  
 PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 1701021206500.00  
 DIRECTIONS: MILL POCKET RIDGE; HWY. 28 E. FROM ELMO TO NIARADA; E. FROM  
                  NIARADA ON DIRT RD., 2 MILES, AND TAKE L. FORK; GO 1 MI.,  
                  TAKE L. FORK TO FIRST RANCH HOUSE ON RIGHT.  
 GENDESC: NE-FACING SLOPE; PALOUSE GRASSLAND DOMINATED BY FESTUCA  
                  IDAHOENSIS, F. SCABRELLA, AND PSEUDOROEGERIA SPICATA  
                  (AGSP); LOWER SLOPE IS PINUS PONDEROSA/PSEUDOTSUGA MENZIESII.  
 ELEV: 3040 SIZE: 20  
 EODATA: SEVEN FLOWERING PLANTS; ROSA WOODSII IS INVADING THE SITE.

COMMENTS: SEE EF FOR MAPS AND SITE PRESERVE SUMMARY. VOUCHER-LESICA,  
 P. (2764), 1983, MONTU.

MACODE1: FBIIRFLAT1MTUS CONTAINED1: Y MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:  
 MOREMGMT: Z SITECODE:

SITENAME:

OWNER: CONF. SALISH & KOOTENAI TRIBES  
 OWNERCOMM: BOX 278, PABLO, MT 59855

PROTCOMM:

MGMTCOMM:

MONITOR: MONITORNUM: -

BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT.

SOURCECODE: PNDLES01MTUS S83LESUMMTUS U85LES02MTUS

DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:  
 TRANSCRIBR: 86-01-23 JSS CDREV: Y MAPPER: 86-01-24 JSS QC: Y  
 UPDATE: 87-02-05 JSS

Table 1. (cont.)

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.005  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 3 TENTEN: 8,1 IDENT: Y EORANK: A  
 SURVEYSITE: CROSSON VALLEY  
 EORANKCOMM:  
 SURVEYDATE: 1983-07-29 LASTOBS: 1988-07-21 FIRSTOBS: 1983 GRANK: 62  
 SRANK: S1 STATE: MT COUNTYNM: MTSAND  
 QUADCODE: 4711476 4711486  
 QUADNAME: MILL POCKET CREEK, HUBBART RESERVOIR PRECISION: M  
 LAT: 475158 LONG: 1143850 S: 475117 N: 475232 E: 1143816 W: 1143948  
 TOWNRANGE: 024N024W SECTION: 03 MERIDIAN: PR TRSCOMM: SE4,2NW4,11N  
 W4,10  
 PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 1701021206700.00  
 DIRECTIONS: CROSSON VALLEY; DIRT RD. 1/4 MI. W. FROM NIARADA; TURN N. ON  
 DIRT ROAD FOR CA. 1.25 MILES; TURN W. 1/2 MI.; TURN N.,  
 FOLLOWING RD. OVER SULLIVAN HILL FOR CA. 4-5 MILES.  
 GENDESC: IN SWALES, ON MODERATELY DEEP SILTY TO SILT LOAM SOILS; N.  
 AND E. ASPECTS ON BOTTOMS AND LOWER SLOPES; WITH FESC/FEID,  
 POA PRATENSIS, STIPA OCCIDENTALIS/FEID.  
 ELEV: 3350 SIZE: 30  
 EODATA: MORE THAN 100 FLOWERING PLANTS, IN AT LEAST FIVE DIFFERENT  
 SUBPOPULATIONS (SEE EF). IN 1988, SUBPOPULATIONS WERE MUCH  
 REDUCED IN SIZE - LIKELY DUE TO DROUGHT CONDITIONS.  
 COMMENTS: SEE EF FOR SITE PRESERVE SUMMARY, SP SURVEY FORM, AND MAPS.  
 VOUCHER - LESICA, P. (2767), 1983, MONTU.  
 MACODE1: PRIVATEOWNMTUS CONTAINED1: ? MACODE2: FBIIRFLAT1MTUS CONTAINED2:  
 Y  
 MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:  
 MOREMGMT: Z SITECODE:  
 SITENAME: CROSSON VALLEY  
 OWNER: GEORGE TRIPP  
 OWNERCOMM: NIARADA, MT.  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR: MONITORNUM: -  
 BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT.  
 SOURCECODE: PNDLES01MTUS S83LESUMMTUS U85LES02MTUS PNDSCH02MTUS  
 DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:  
 TRANSCRIER: 86-01-23 JSS CDREV: Y MAPPER: 86-01-31 JSS QC: Y  
 UPDATE: 88-12-02 LAS

Table 1. (cont.)

## Montana

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCARØU1SØ.ØØØ  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 1Ø TENTEN: 4,2 IDENT: Y EORANK: B  
 SURVEYSITE: TOBACCO PLAINS NORTH  
 EORANKCOMM: 1988, DRY YEAR - POPULATION MAY BE LARGER  
 SURVEYDATE: 1986-07-17 LASTOBS: 1988-07-18 FIRSTOBS: 1986 GRANK: G2  
 SRANK: S1 STATE: MT COUNTYNAME: MTLINC  
 QUADCODE: 4811581  
 QUADNAME: EUREKA NORTH PRECISION: SC  
 LAT: 485928 LONG: 1150454 S: 485926 N: 48593Ø E: 1150445 W: 1150501  
 TOWNRANGE: Ø37NØ27W SECTION: 11 MERIDIAN: PR TRSCOMM: NW4

PHYSPROV: NR WATERSHED: 17010101 RIVERREACH:  
 DIRECTIONS: TOBACCO PLAINS, ABOUT 8 MILES N.OF EUREKA. 2ND SUBPOPULATION  
 NORTH OF ROAD EXTENDING UP TO AND OVER CANADIAN BORDER.

GENDESC: IN GRASSLANDS ON LOW, NORTH-FACING SLOPES; WITH FESTUCA  
 IDAHOENSIS, FESTUCA SCABRELLA.

ELEV: 270Ø SIZE: 3  
 EODATA: LOCALLY COMMON. 2ND SUBPOPULATION WITH 6 PLANTS, FLOWERING  
 IN 1988.

COMMENTS: NONE.

MACODE1: PRIVATEOWNMTUS	CONTAINED1:	MACODE2:	CONTAINED2:
MACODE3:	CONTAINED3:	ADLMAS:	MORELAN:
MOREMGMT: Z	SITECODE:		MOREPROT:
SITENAME:			
OWNER:			
OWNERCOMM:			
PROTCOMM:			
MGMTCOMM:			
MONITOR:	MONITORNUM:		
BESTSOURCE: LESICA, P. (3978). 1986. SPECIMEN #104445 UM. SCHASSBERGER L.A. 1988. SPECIMEN # 249 MONTU.			
SOURCECODE: S86LESUMMTUS PNDLESØ1MTUS F88SCHØ6MTUS PNDSCHØ2MTUS S88SCHUMMTUS			
DATASENS: N	BOUNDARIES: Y	PHOTOS: Y	OWNERINFO:
TRANSCRIBR: 87-08-17 JEG	CDREV: Y	MAPPER: 87-08-19 JEG	QC: Y
UPDATE: 88-12-02 LAS			

Montana  
ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.009  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 2 TENTEN: 8,10 IDENT: Y EORANK: C  
 SURVEYSITE: CROMWELL CREEK  
 EORANKCOMM: HEAVILY GRAZED PASTURE  
 SURVEYDATE: 1988-07-22 LASTOBS: 1988-07-22 FIRSTOBS: 1988 GRANK: G2  
 SRANK: S1 STATE: MT COUNTYNAME: MTFLAT  
 QUADCODE: 4711485  
 QUADNAME: KOFFORD RIDGE PRECISION: SC  
 LAT: 475233 LONG: 1143056 S: Ø N: Ø E: Ø W: Ø  
 TOWNRANGE: Ø25NØ23W SECTION: 35 MERIDIAN: PR TRSCOMM: SE4  
 PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 1701021206400.00  
 DIRECTIONS: CA. 4.1 AIR MILES NE OF NIARADA; TRAVEL CA. 4.3 MILES N OF  
 HIGHWAY 28 ON CROMWELL CREEK ROAD, SE OF ROAD ON HILLSIDE  
 JUST BELOW TREELINE.  
 GENDESC: PROTECTED DRAW ON SLOPE IN GRAVELLY SILT LOAM WITH FESTUCA  
 SCABRELLA AND ROSA spp.  
 ELEV: 3420 SIZE: 1  
 EODATA: 10 PLANTS FLOWERING, BUT DRYING OUT FROM THE BOTTOM UP.

COMMENTS: VOUCHER - SCHASSBERGER, L.A. (250), 1988, MONTU.

MACODE1: PRIVATEOWNMTUS CONTAINED1: Y MACODE2: CONTAINED2:  
 MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:  
 MOREMGMT: B SITECODE:  
 SITENAME:  
 OWNER: ELSIE BROWN  
 OWNERCOMM:  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR: MONITORNUM:  
 BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN LAKE, SANDERS,  
 FLATHEAD AND LINCOLN COUNTIES OF 18-29 JULY.  
 SOURCECODE: FB8SCH06MTUS PNDSCH02MTUS S88SCHUMMTUS  
 DATASENS: BOUNDARIES: Y PHOTOS: Y OWNERINFO:  
 TRANSCRIBR: 88-08-04 LAS CDREV: Y MAPPER: 88-08-04 LAS QC: Y  
 UPDATE: 88-08-18 MEZ

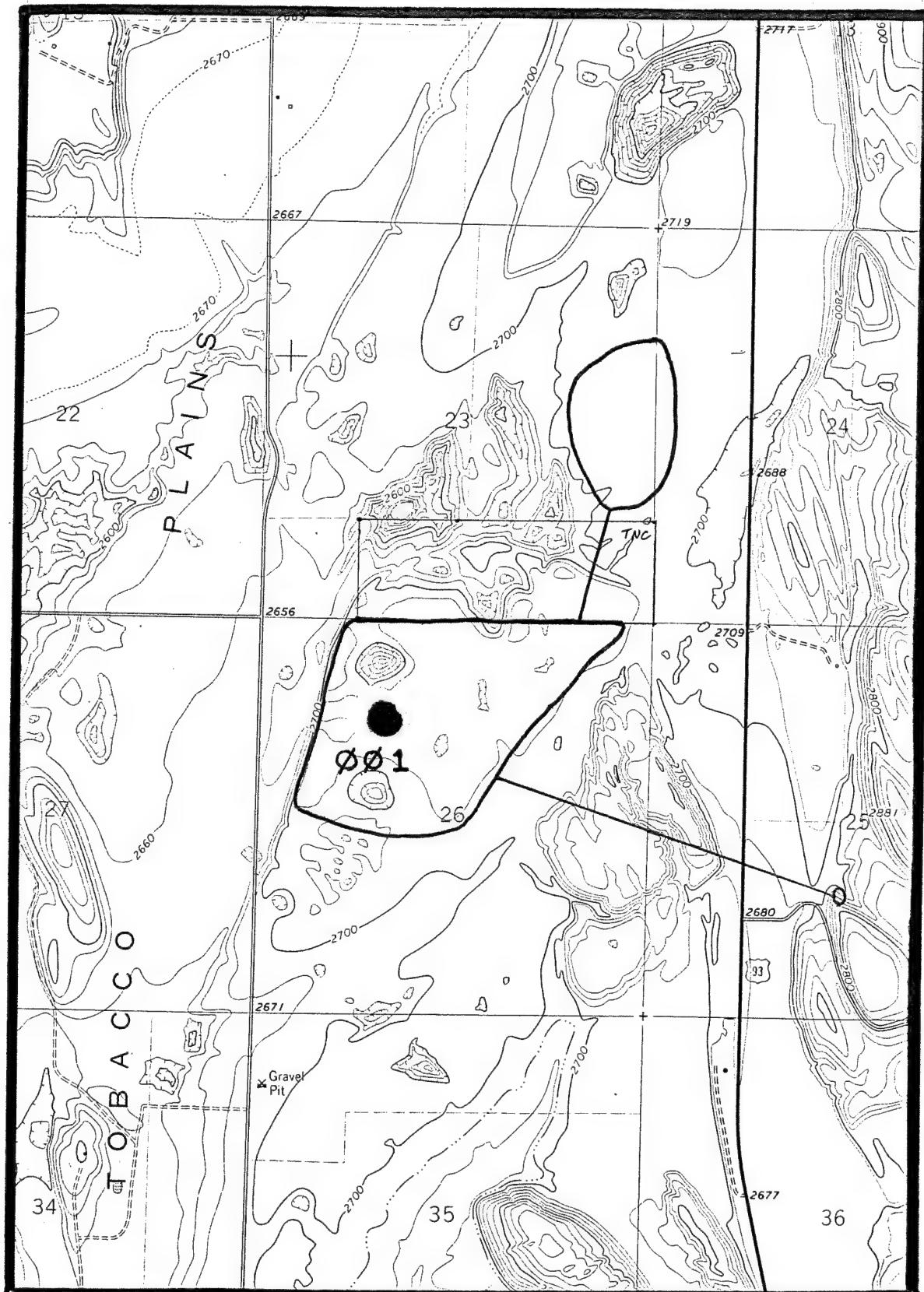
## Montana

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCARØU1SØ.Ø1Ø  
 NAME: SILENE SPALDINGII  
 COMMONNAME: SPALDING CAMPION  
 MARGNUM: 4 TENTEN: 7,2 IDENT: Y EORANK: C  
 SURVEYSITE: HOG HEAVEN RANGE  
 EORANKCOMM: HEAVILY GRAZED PASTURE  
 SURVEYDATE: 1988-07-27 LASTOBS: 1988-07-27 FIRSTOBS: 1988 GRANK: 62  
 SRANK: S1 STATE: MT COUNTYNAME: MTFLAT  
 QUADCODE: 4711475  
 QUADNAME: NIARADA PRECISION: SC  
 LAT: 475104 LONG: 1143144 S: 475101 N: 475111 E: 1143135 W: 1143146  
 TOWNRANGE: 024N023W SECTION: 10 MERIDIAN: PR TRSCOMM: SE4  
 PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 1701021206400.00  
 DIRECTIONS: CA. 3.8 AIR MILES NE OF NIARADA, CA. 1.2 MILES N OF HIGHWAY  
     28 ON BROWNS MEADOW ROAD, CA. 1.5 MILES E OF BROWN RANCH,  
     ON HILLSIDE BELOW TREELINE.  
 GENDESC: PROTECTED DRAWS AND SLOPES IN GRAVELLY SILT LOAM WITH FES-  
     TUCA SCABRELLA AND ROSA SP.  
 ELEV: 3500 SIZE: 1  
 EODATA: TWELVE PLANTS IN TWO SUBPOPULATIONS, FLOWERING.

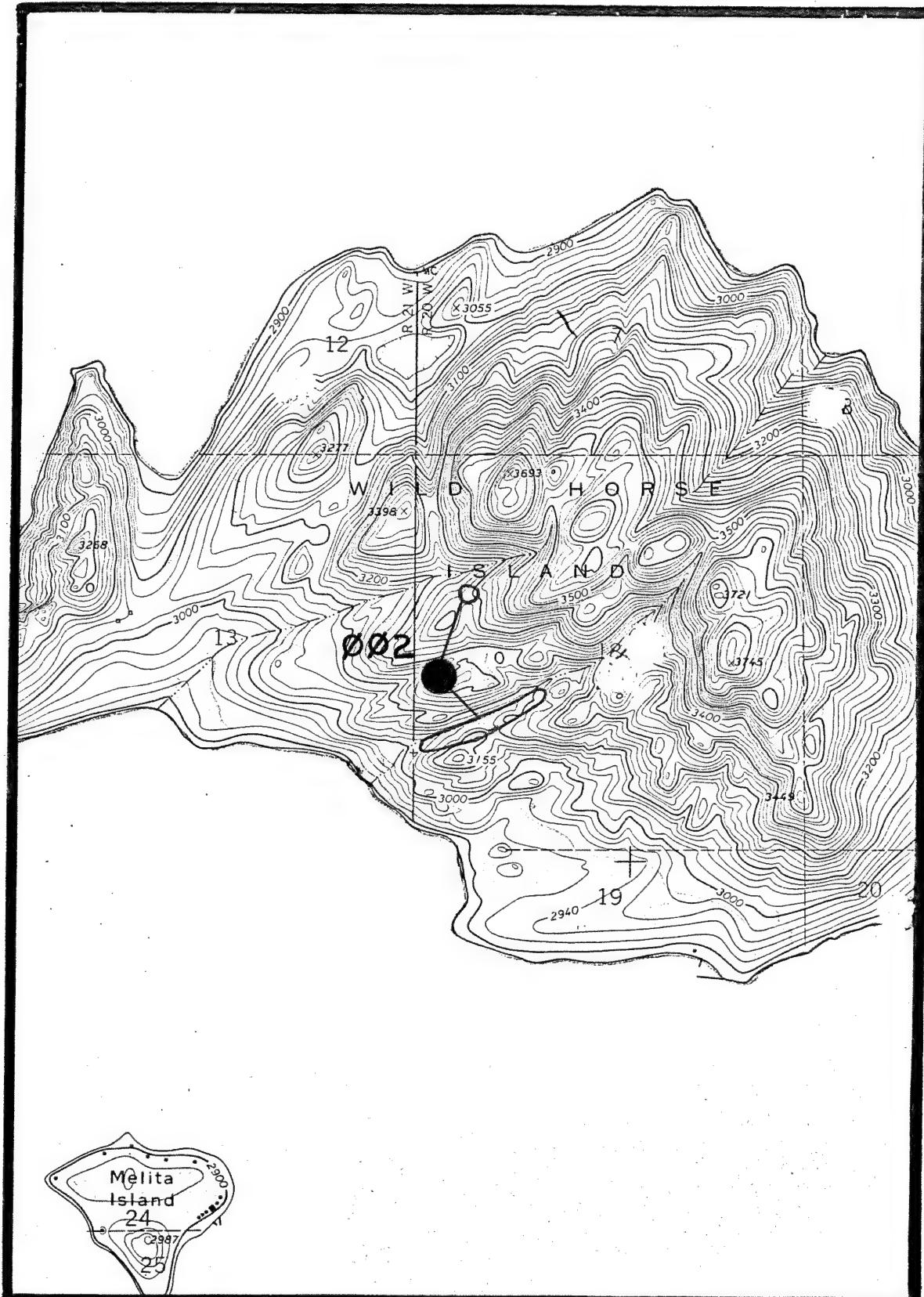
COMMENTS: NO SPECIMEN. SEE GMF BASE MAP SHOWING SUBPOPULATIONS. LOCA-  
     TED NEAR BOUNDARY OF FLATHEAD INDIAN RESERVATION.  
 MACODE1: PRIVATEOWNMTUS CONTAINED1: Y MACODE2: CONTAINED2:  
 MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:  
 MOREMGMT: Z SITECODE:  
 SITENAME:  
 OWNER: ELSIE BROWN  
 OWNERCOMM:  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR: MONITORNUM:  
 BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN LAKE, SANDERS,  
     FLATHEAD AND LINCOLN COUNTIES OF 18-29 JULY.  
 SOURCECODE: F88SCHØ6MTUS PNDSCHØ2MTUS S88SCHUMMTUS  
 DATASENS: BOUNDARIES: Y PHOTOS: Y OWNERINFO:  
 TRANSCRIBR: 88-08-04 LAS CDREV: Y MAPPER: 88-08-04 LAS QC: Y  
 UPDATE: 88-08-18 MEZ

Table 1. (cont.)



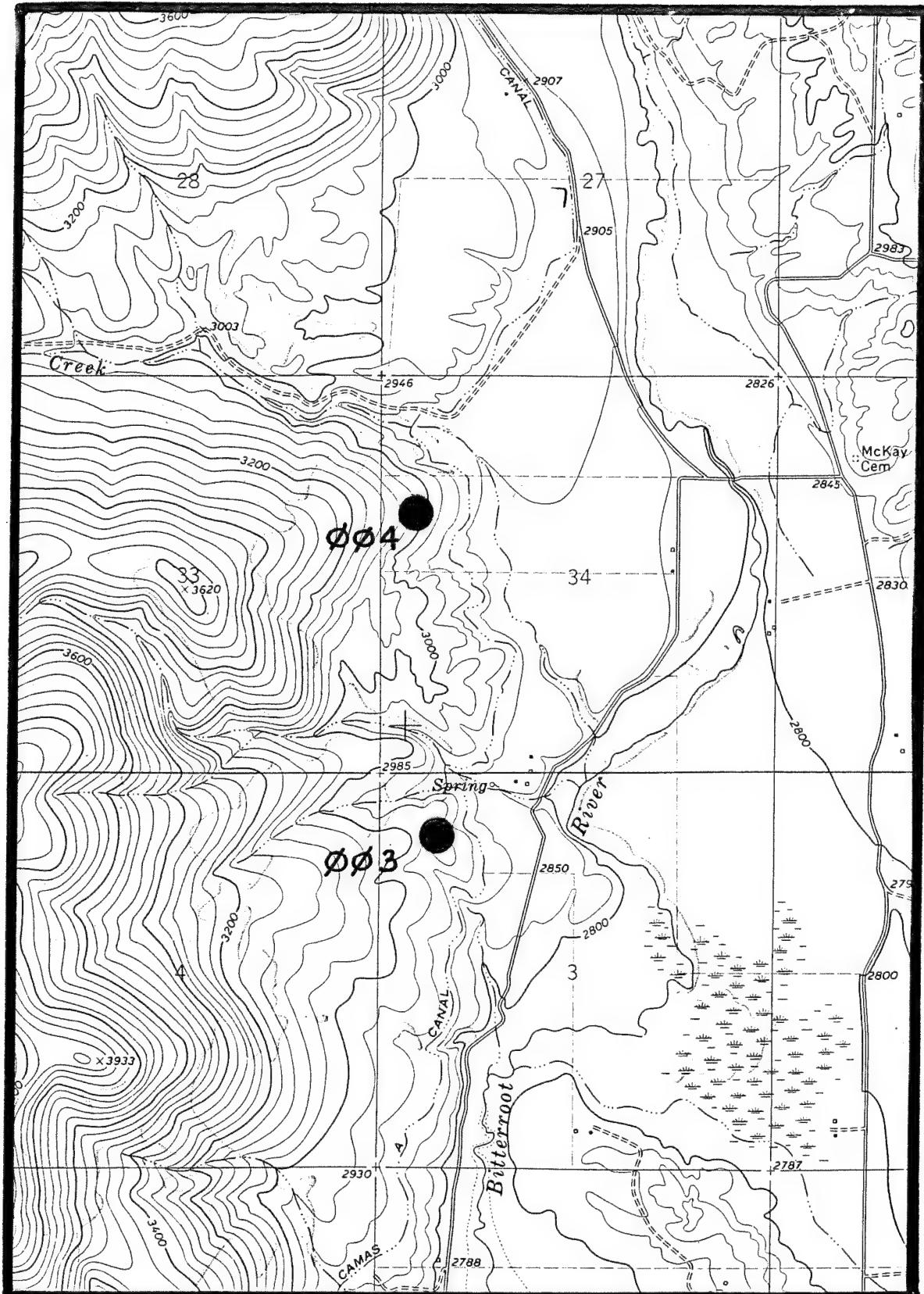
USGS Eureka North Quadrangle 7.5'.

Dancing Prairie-Tobacco Plains South (001)



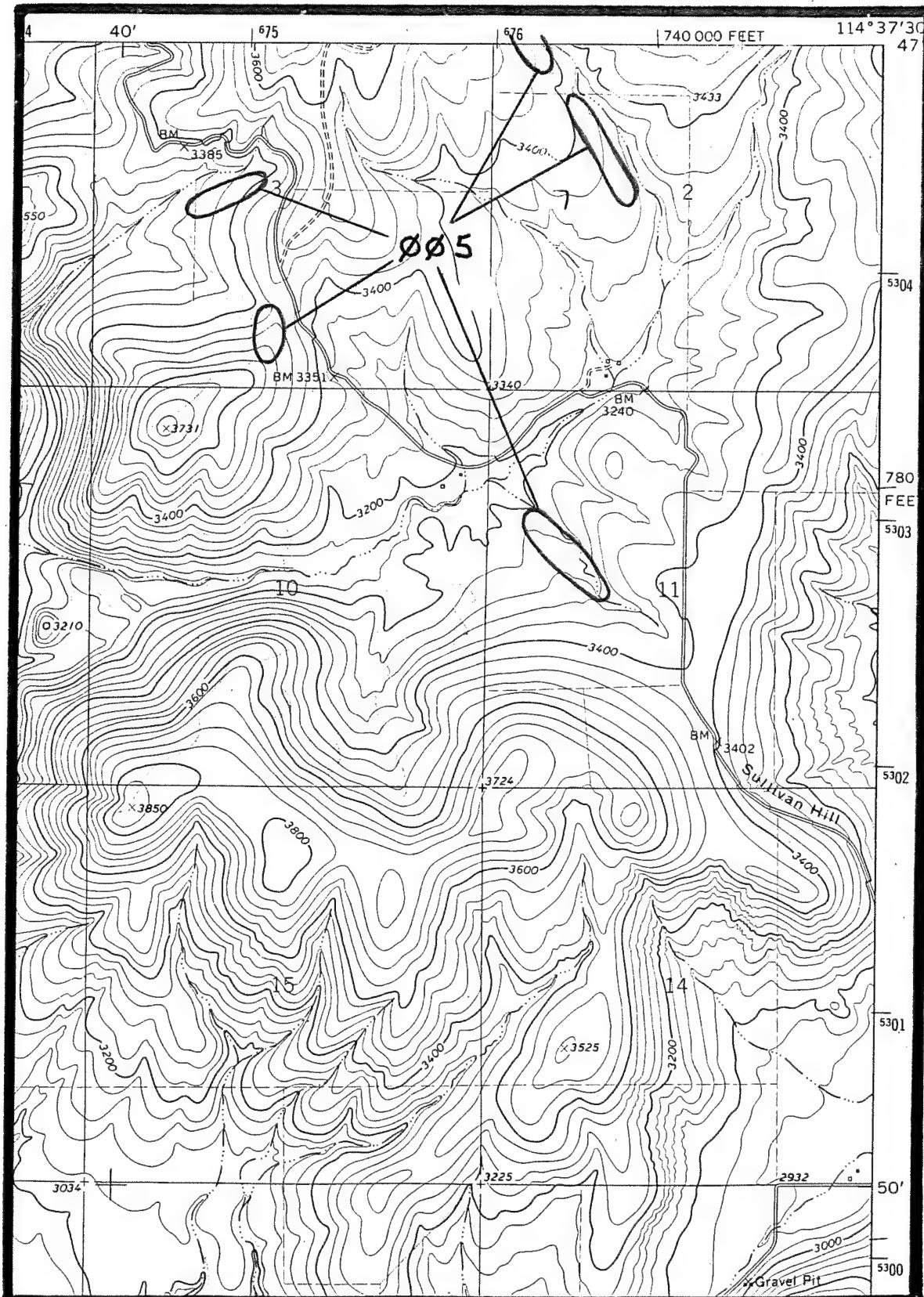
USGS Wild Horse Island State Park Quadrangle 7.5'.

Wild Horse Island (002)



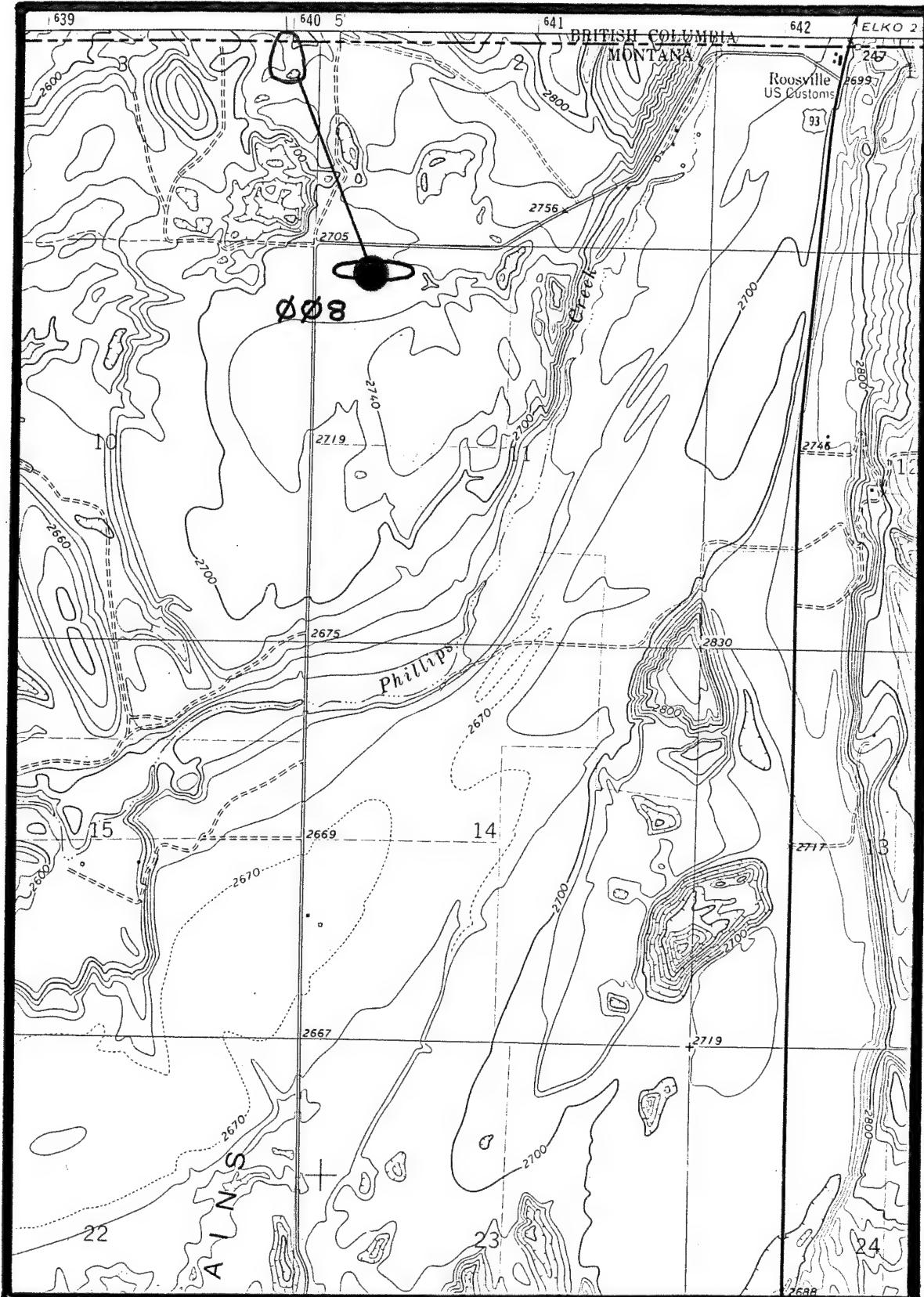
USGS Mill Pocket Creek Quadrangle 7.5'.

Black Bear Ranch (003)  
Mill Pocket Ridge (004)



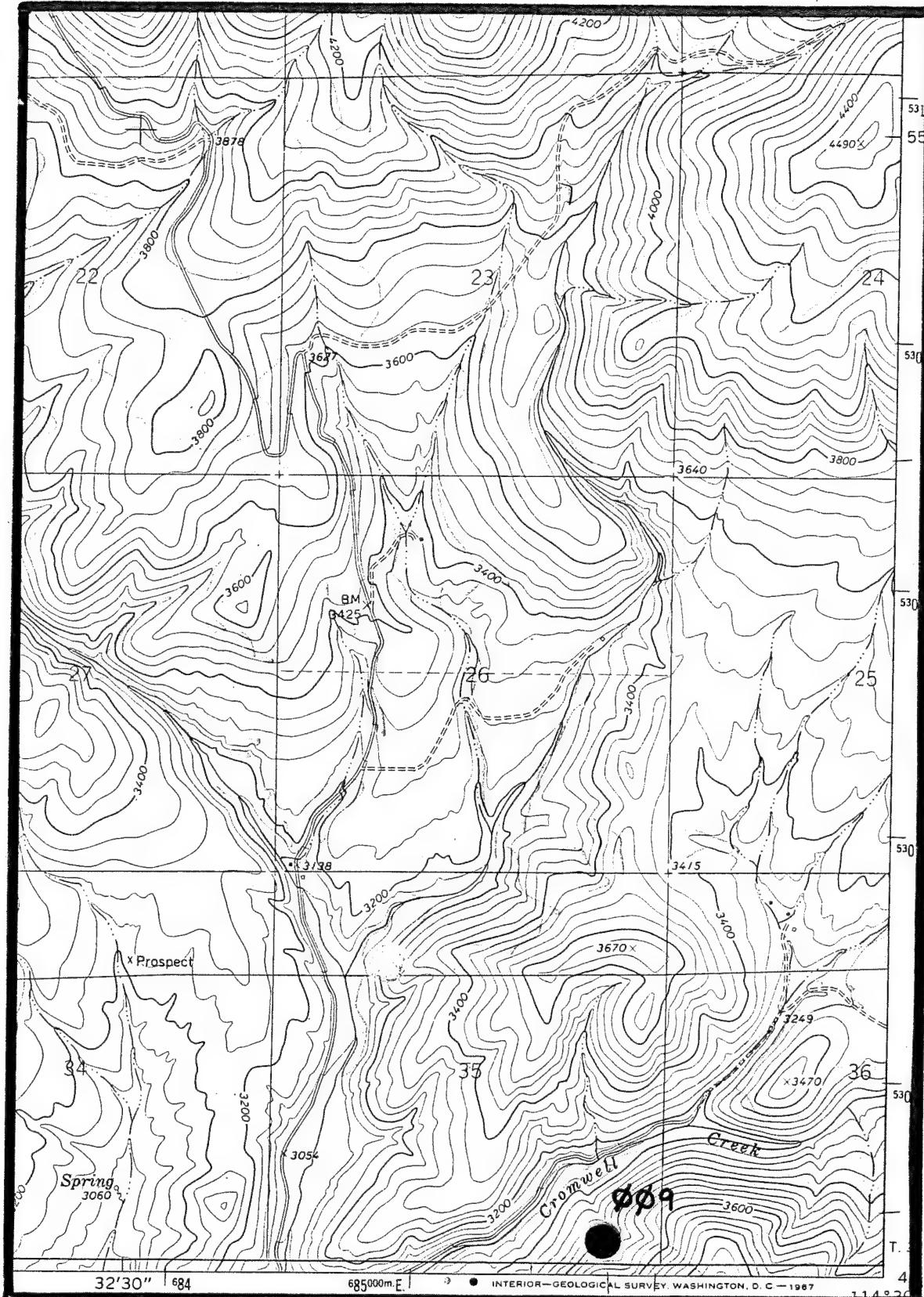
USGS Mill Pocket Creek Quadrangle 7.5'.

Crosson Valley (005)



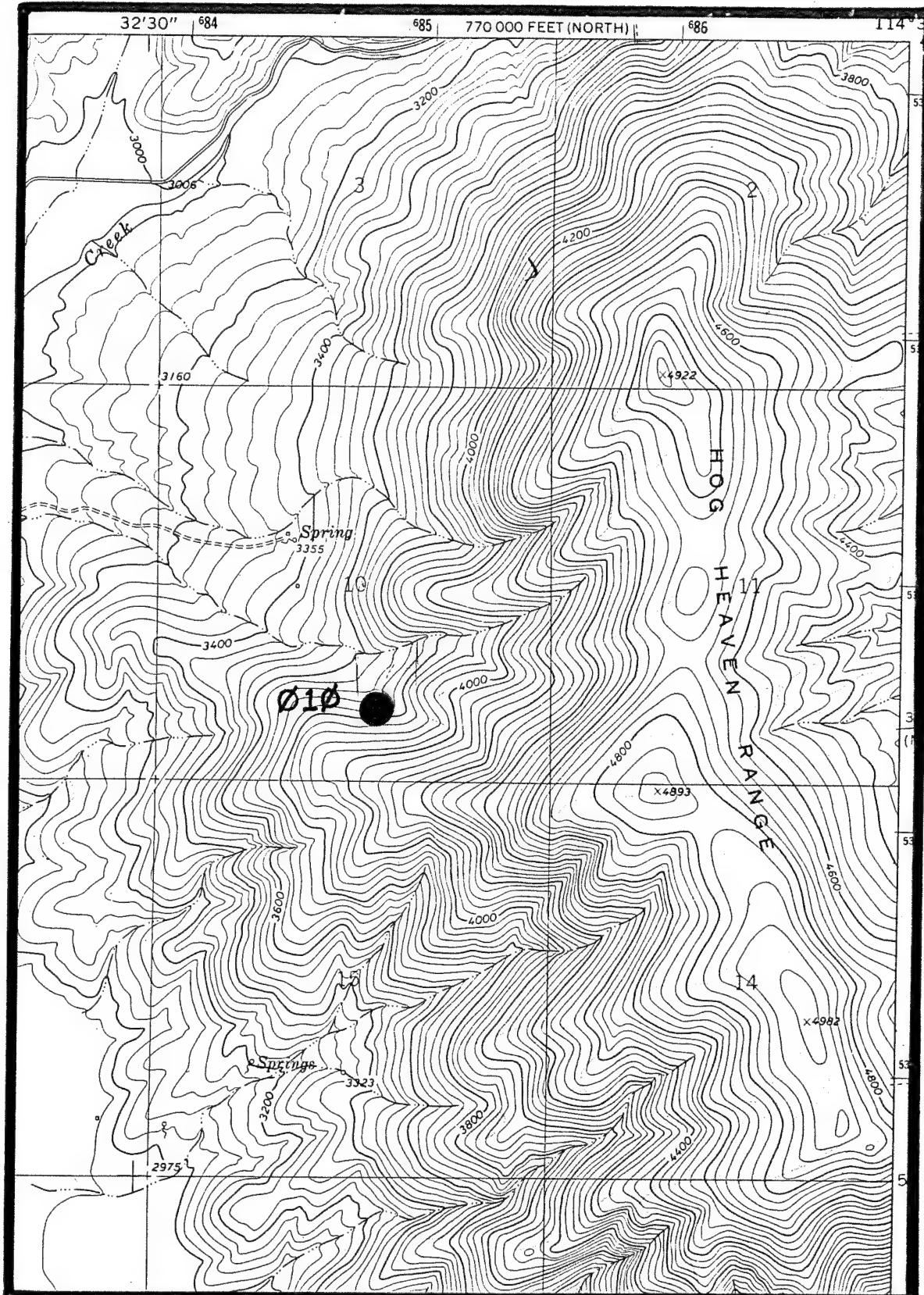
USGS Eureka North Quadrangle 7.5'

Tobacco Plains North (008)



USGS Kofford Ridge Quadrangle 7.5'.

Cromwell Creek (009)



USGS Niarada Quadrangle 7.5'.

Hog Heaven Range (010)

- b. **Idaho:** See Table 2, pp. 27-28, for occurrence records on the following sites.

Cold Spring Creek (001)  
Lawyers Creek (004)

- c. **Washington:** See Table 3, pp. 29-34, for occurrence records on the following sites.

Sites:	(005)	(013)
	(006)	(014)
	(007)	(015)
	(008)	(016)
	(009)	(017)
	(010)	(018)
	(011)	(019)
	(012)	

2. **Populations known or assumed extirpated.**

- a. **Oregon:** The population at Darr Flat (002), listed in Table 4, p. 35, was discovered in 1983, but a survey of the site in 1986 revealed no plants. The population is presumed to have been lost to the heavy grazing that occurs in the area.

- b. **Washington:** Site (002) in Whitman County was surveyed in 1981 and believed to be extirpated; Table 4, p. 36.

3. **Historically known populations where current status is not known:** See Table 5, pp. 37-39, for occurrence records on the following sites.

- a. **Montana:** A collection was made by R.S. Williams in 1894 (Columbia Falls (006)). The collection label only refers to a general location: "Columbia Falls." The area in the vicinity of the town has been searched, but much of this land has been converted for agricultural use and the population has not been relocated (Peter Lesica, pers. comm.; Lisa A. Schassberger pers. obs.).

- b. **Idaho:** Daubie's Stand 162 (002) has not been recently revisited; therefore current information is not available on its condition.

ELEMENT OCCURRENCE CODE: PDCAROU1S0.001  
 NAME: SILENE SPALDINGII  
 COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE  
 MARGNUM: 3 TENTEN: IDENT: Y EORANK: BC  
 EORANKCOMM: MORE THAN THREE DOZEN INDIVIDUALS  
 SURVEYDATE: 1985-08-06 LASTOBS: 1985-08-06 FIRSTOBS: 1964 GRANK: G2  
 SURVEYSITE: COLD SPRING CREEK  
 SRANK: S1 STATE: ID COUNTYNAME: IDLEWI  
 QUADCODE: 4611625  
 QUADNAME: WINCHESTER EAST PRECISION: SC  
 LAT: 461415 LONG: 1163019 S: 461400 N: 461430 E: 1163015 W: 1163130  
 TOWNRANGE: 033N002W SECTION: 01 MERIDIAN: BO  
 TRSCOMM: NW4NE4 WATERSHED: 17060306  
 DIRECTIONS: TURN NORTH ON GRAVEL ROAD JUST WEST OF WHERE U.S. HWY 95  
 CROSSES OVER COLD SPRING CREEK ABOUT TWO MILES WEST OF  
 CRAIGMONT. SITE IS IN LOOP OF ROAD ALONG WEST SLOPE CANYON.  
 GENDESC: A SMALL TRACT OF CANYON WALL PRAIRIE PRESERVED BETWEEN A  
 LOOP OF THE ROAD AND A FENCELINE.  
 ELEV: 3750 SIZE: 2  
 EODATA: DAUBENMIRE'S FESTUCA IDAHOENSIS-ROSA SPP. ASSOCIATION. ABOUT  
 THREE DOZEN INDIVIDUALS WERE FLOWERING WHEN LAST OBSERVED;  
 MOST ARE ADJACENT TO SHRUB PATCH TO EAST OF LARGE PINE TREE;  
 OTHERS ARE SCATTERED ABOUT THE VICINITY OF THE TREE.  
 COMMENTS: DAUBENMIRE 6429; HEIDEL BLM REPORT 1979.  
 MACODE1: CONTAINED1: MACODE2: CONTAINED2:  
 MACODE3: CONTAINED3: ADDLMAS:  
 MORELAND: MOREPROT: MOREMGMT: SITECODE:  
 SITENAME:  
 OWNER:  
 OWNERCOMM: PRIVATE  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR:  
 BESTSOURCE: CAICCO, STEVE MONITORNUM:  
 SOURCECODE: PNDCAI01IDUS PNDJOH01IDUS PNDHEI01IDUS

DATASENS: N BOUNDARIES: Y PHOTOS: N OWNERINFO: N  
 TRANSCRIBR: 84-10-18 SLC CDREV: Y MAPPER: 84-10-18 SLC QC: Y  
 UPDATE: 85-09-15 SLC

Table 2. Occurrence records for extant populations in Idaho.

11/07/88

## Idaho Occurrence Record

ELEMENT OCCURRENCE CODE: PDCAROU1S0.004  
 NAME: SILENE SPALDINGII  
 COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE  
 MARGNUM: 2 TENTEN: 07,04 IDENT: Y EORANK: D  
 EORANKCOMM:  
 SURVEYDATE: LASTOBS: 1980-09-11 FIRSTOBS: 1980 GRANK: G2  
 SURVEYSITE: LAWYERS CREEK SRANK: S1 STATE: ID COUNTYNAME: IDLEWI  
 QUADCODE: 4611624 QUADNAME: CRAIGMONT PRECISION: M  
 LAT: 461214 LONG: 1162510 S: 461100 N: 461300 E: 1162500 W: 1162530  
 TOWNRANGE: 033N001W SECTION: 14 MERIDIAN: BO  
 TRSCOMM: WATERSHED: 17060306031  
 DIRECTIONS: Lawyers Creek; pull-off road about 500 yds from the "slower traffic turn-off ahead" sign.  
 GENDESC: E & NE slope of 5-10%; clay/loam; at edge of CRDO/Alnus thicket.  
 ELEV: 3600 SIZE: 1  
 EODATA: only 2 individuals in 1980.

## COMMENTS:

MACODE1: CONTAINED1: MACODE2: CONTAINED2:  
 MACODE3: CONTAINED3: ADDLMAS:  
 MORELAND: Y MOREPROT: Y MOREMGMT: ? SITECODE:  
 SITENAME:  
 OWNER: private  
 OWNERCOMM:  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR: MONITORNUM:  
 BESTSOURCE: Hurd, M. 1980. Threatened or Endangered Plant Report.  
 Cottonwood RA, BLM.  
 SOURCECODE: U80HUR01IDUS

DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO: N  
 TRANSCRIBR: 87-03-11 SLC CDREV: Y MAPPER: 87-03-11 SLC QC: Y  
 UPDATE: 88-11-07 PJP

Table 2. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM  
SILENE SPALDINGII RECORDS  
DATA CURRENT AS OF NOVEMBER 1, 1998

Table 3. Occurrence records for extant populations in Washington.

**WASHINGTON NATURAL HERITAGE DATA SYSTEM  
SILENE SPALDINGII RECORDS**

NAME: SILENE SPALDINGII 007	INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUUU	
NUMBER OF OWNERS: .	
NAME OF OWNER: .	
FEDERAL STATUS: C2	
STATE STATUS: SPT	
STATE RANK: S2	
NAME OF AGENCY:	
AGENCY SUBSECTION:	
SOURCE OF LEAD:	
GENERAL DESCRIPTION:	
DATA POINT: 3	
DATE OF ENTRY: 8204	
NAME: SILENE SPALDINGII 008	INDEX CODE: JN.L76
OWNERSHIP CODE: ST.WSU	
NUMBER OF OWNERS: .	
NAME OF OWNER: .	
FEDERAL STATUS: C2	
STATE STATUS: SPT	
STATE RANK: S2	
NAME OF AGENCY:	
AGENCY SUBSECTION:	
SOURCE OF LEAD:	
GENERAL DESCRIPTION:	
DATA POINT: 11	
DATE OF ENTRY: 8528	
NAME: SILENE SPALDINGII 009	INDEX CODE: JN.L76
OWNERSHIP CODE: PVTIN	
NUMBER OF OWNERS: .	
NAME OF OWNER: NYGREEN	
FEDERAL STATUS: C2	
STATE STATUS: SPT	
STATE RANK: S2	
NAME OF AGENCY:	
AGENCY SUBSECTION:	
SOURCE OF LEAD:	
GENERAL DESCRIPTION:	
DATA POINT: 15	
DATE OF ENTRY: 8204	

DATA CURRENT AS OF NOVEMBER 1988

VALDINGII 007	INDEX CODE: JN.L76	SHIP CODE: PVTUU	DF OWNERS: .	DATE: 198108	SITE VISITATION: 81E	PRECISION: C	THREAT: .	SIZE: .	EO RANK: CD	NAME OF AREA: .	AGENCY SUBSECTION: .	SOURCE OF LEAD: BARRETT J 1981B MJAB244 002 (1 PREV COL 1979)
								GENERAL DESCRIPTION: AUG 24. CA 1.5 MI SW OF LAMONT, JUST PAST JCT OF 2 GRAVEL RDS. ON SMALL PATCH OF VEG AMONG PLUNED LAND, ON HILLSIDE ADJ TO PLAIN. EL 2050, SL 300EG, ASP NM. 23 PLTS ON 3 ACRES. SOIL BROWN, DEEP, FINE. VEG: ARBT 2/FEID IN FAIRLY GOOD SHAPE,				
								ELEVATION: TA POINT: 3 DNR REGION: 1 DIRECTIONS: DNR REGION: 1				
								ASPECT: DF ENTRY: 8204 BOUNDARIES: .				

NAME: SILENE SPALDINGII 008	INDEX CODE: JN.L76	DATE: 19830630	SITE REVISITATION: 81E83E	PRECISION: C	THREAT: .	SIZE: .	EO RANK: C	AGENCY SUBSECTION: AUGENSTEIN, EJ (NJAB250, 00111983 (2 PREV COLL 1979, 81))	SOURCE OF LEAD: AUGENSTEIN, EJ (NJAB250, 00111983 (2 PREV COLL 1979, 81))	GENERAL DESCRIPTION: HSU PRAIRIE STRIP. 33 PLTS SCATTERED OVER 3 ACRES, UP FROM 9 COUNTED IN 1981. IN A HALF OF STRIP, MOSTLY ON S SLOPE, BUT SOME ON TOP OF RIDGE. IN FEED/SYAL HT , MOSTLY IN GRASSIER AREAS. PLTS APPEAR HEALTHY: 1 W 5 STENS. IN LATE BLOOM.	DIR ELEVATION: MDS REGION: 1 DNR REGION: 1	PHOTOS: .	VERIFICATION: V SURVEY: .	REFERENCES: A
NAME: SILENE SPALDINGII 009	INDEX CODE: JN.L76	DATE: 19910830	SITE REVISITATION: 81E835:	PRECISION: C	THREAT: .	SIZE: .	EO RANK: DC	AGENCY SUBSECTION: NYGREEN, EATON	SOURCE OF LEAD: NYGREEN, EATON	GENERAL DESCRIPTION: GRANITE POINT 7.5	DIR ELEVATION: MDS REGION: 1 DNR REGION: 1	PHOTOS: .	VERIFICATION: V SURVEY: .	REFERENCES: A
NAME: SILENE SPALDINGII 010	INDEX CODE: JN.L76	DATE: 19910830	SITE REVISITATION: 81E835:	PRECISION: C	THREAT: .	SIZE: .	EO RANK: DC	AGENCY SUBSECTION: NYGREEN, EATON	SOURCE OF LEAD: NYGREEN, EATON	GENERAL DESCRIPTION: GRANITE POINT 7.5	DIR ELEVATION: MDS REGION: 1 DNR REGION: 1	PHOTOS: .	VERIFICATION: V SURVEY: .	REFERENCES: A
NAME: SILENE SPALDINGII 011	INDEX CODE: JN.L76	DATE: 19910830	SITE REVISITATION: 81E835:	PRECISION: C	THREAT: .	SIZE: .	EO RANK: DC	AGENCY SUBSECTION: NYGREEN, EATON	SOURCE OF LEAD: NYGREEN, EATON	GENERAL DESCRIPTION: GRANITE POINT 7.5	DIR ELEVATION: MDS REGION: 1 DNR REGION: 1	PHOTOS: .	VERIFICATION: V SURVEY: .	REFERENCES: A

SOURCE OF LEAD: BARRETT J 1981B WJAB041,010 (1 PREV COL 1980)  
 GENERAL DESCRIPTION: GEN VERY SPARSE, EXCEPT FOR A CLUSTER OF 9 PLS. 21 PLS TOTAL ON CA 50 ACRES.  
 UPPER PART OF WAWAHAW CYN, S SIDE. FROM 0.25MI TO 1MI SHOF RD JCT. O N N TO NW-  
 FACING SL ABOVE THE CYN RD. EL 2300-2600FT, SL 15-45DEG. (SEE GMF-03 SITE REVIS)  
 DATA POINT: 15 WDG REGION: I DIRECTIONS: V  
 ELEVATION: 15 DNR REGION: B  
 DATE OF ENTRY: 8/20/04 ASPECT: B  
 DATE OF ENTRY: 8/20/04 BOUNDARIES: B  
 DATE OF ENTRY: 8/20/04 SURVEY: B  
 DATE OF ENTRY: 8/20/04 PHOTOS: B  
 DATE OF ENTRY: 8/20/04 VERIFICATION: B  
 DATE OF ENTRY: 8/20/04 DIFFERENCES: B

Table 3. (cont.)

## WASHINGTON NATURAL HERITAGE DATA SYSTEM

## SILENE SPALDINGII RECORDS

DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 010	INDEX CODE: JN.L76	OWNERSHIP CODE: PVT/PIN	NUMBER OF OWNERS: 1	NAME OF OWNER: AESCHLEMAN, ARNOLD	FEDERAL STATUS: C2	STATE STATUS: SPT	STATE RANK: S2	NAME OF AREA:	AGENCY SUBSECTION:	SOURCE OF LEAD: AUGENSTEIN, EJ (MJAB336,001 & MBLH054) 1983 (2 PREV COLL, 1980,81)	GENERAL DESCRIPTION: SPAULDING RD, CA 50 PLTS IN OPEN FELD/SYAL BETWEEN CRDO THICKETS, W AESP, KOCR, RCHO, BASA, GEYL, ACHL, GENTIANA AFFINIS, GEUM TRIFLORUN, MAPLOPAFFUS LIATRIFORMIS, ASTER JESSICAE. VEG UNGRAZED AT PRESENT. THREAT: SPREAD OF CRDO; HERBICIDE	DATE: 19830904	SITE REVISITATION: 81E85E	PRECISION: C	THREAT:	SIZE: *	EO RANK: C	PROTECTION STATUS: .	TRNS: T15N R42E S35	QUADCODE: 4611764	QUADNAME: ALMOTA 7.5	LATLONG: 464420N1172904W	COUNTY: WHITMAN	PROVINCE: CB	SPECIAL STATUS: PRS	VERIFICATION: V	REFERENCES: A
DATA POINT: 31	DATE OF ENTRY: 8528	ELEVATION:	ASPECT:		WDG REGION: 1	DNR REGION: 1																					
NAME: SILENE SPALDINGII 011	INDEX CODE: JN.L76	OWNERSHIP CODE: PVT/PIN	NUMBER OF OWNERS: 1	NAME OF OWNER: SCHULTHEIS, GENE	FEDERAL STATUS: C2	STATE STATUS: SPT	STATE RANK: S2	NAME OF AREA:	AGENCY SUBSECTION:	SOURCE OF LEAD: AUGENSTEIN, EJ(MBLH057,084) 1983 (KEMP FARM RS 75-6)	GENERAL DESCRIPTION: .25 MI LONG EYEBROW OF NATIVE VEGETATION, S OF MAMMAL RD. 51 PLTS COUNTED, GROW INS ON LOWER PTS OF 2 CONVEX SLOPES(WERE MORE MOIST) WITH FEID, ROSA, SYAL, PRVI LUFIRUS, GENTIAN, ERTE IN PATCHES. SLIGHT DAMAGE FROM HERBICIDE DRIFT ON W END.	DATE: 19830904	SITE REVISITATION: 81E83E	PRECISION: C	THREAT:	SIZE: *	EO RANK: C	PROTECTION STATUS: 2	TRNS: T15N R42E S32 NEORMA	QUADCODE: 4611752	QUADNAME: COLTON 7.5	LATLONG: 463415N1171049W	COUNTY: WHITMAN	PROVINCE: CB	SPECIAL STATUS: REG	VERIFICATION: V	REFERENCES: A
DATA POINT: 15	DATE OF ENTRY: 8528	ELEVATION:	ASPECT:		WDG REGION: 1	DNR REGION: 1																					
NAME: SILENE SPALDINGII 012	INDEX CODE: JN.L76	OWNERSHIP CODE: PVT/PIN	NUMBER OF OWNERS: .	NAME OF OWNER: .	FEDERAL STATUS: C2	STATE STATUS: SPT	STATE RANK: S2	NAME OF AREA:	AGENCY SUBSECTION:	SOURCE OF LEAD: BARRETT J 1981B MJAB038,004 (1 PREV COL, 1980)	GENERAL DESCRIPTION: AUG 31. UPPER STEPTOE CYN DRAINAGE, JUST OFF THE SCHLEE RD, AROUND LARGE BEND IN ROAD, S SIDE OF RD, ON SLOPE. 34 PLS ON CA 10 ACRES. RANGE EXTENDS CA 0.4 MI OF RD. EL 2600-2700FT, ASP NE TO NW, SL 20-35DEG. VEG: CRDO THICKETS PRESENT. SISP2	DATE: 198108	SITE REVISITATION: 81E	PRECISION: C	THREAT:	SIZE: *	EO RANK: C	PROTECTION STATUS: .	TRNS: T12N R45E S15	QUADCODE: 4611752	QUADNAME: COLTON 7.5	LATLONG: 463135N117052W	COUNTY: WHITMAN	PROVINCE: CB	SPECIAL STATUS: REG	VERIFICATION: V	REFERENCES: B
DATA POINT: 16	DATE OF ENTRY: 8150	ELEVATION:	ASPECT:		WDG REGION: 1	DNR REGION: 1																					

Table 3. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM  
SILENE SPALDINGII RECORDS

NAME: SILENE SPALDINGII 013	DATA CURRENT AS OF NOVEMBER 1986
INDEX CODE: JN.L76	
OWNERSHIP CODE: PVTUUU	
NUMBER OF OWNERS: .	
NAME OF OWNER: .	
FEDERAL STATUS: C2	
STATE STATUS: SPT	
STATE RANK: S2	
NAME OF AREA:	
AGENCY SUBSECTION:	
SOURCE OF LEAD: BARRETT J 1981B MJAB038 003 (1 PREV COL 1980)	
GENERAL DESCRIPTION: AUG 31. UPPER STEPTOE CYN, JUST NNE OF THE NESTERBANK RANCH, ON E SLOPE OF CYN. 12 PLS. ON 3 ACRES, STRIP OF VEG JUST BELOW WHEAT FIELD. RANGE EXTENDS CA 0.2MI. EL CA 2700 FT, ASP W, SL 30DEG. VEG: CRIO THICKETS COMMON. SISP2 OCCURS IN FLD-.	
DATA POINT: 13	
DATE OF ENTRY: 8150	
ASPECT: B	
DATE REVISITATION: 81E	
PRECISION: C	
THREAT: .	
SIZE: .	
EO RANK: DC	
PROTECTION STATUS: .	
TR: T12N R45E S09	
QUADCODE: 4611752	
QUADRANGLE: COLTON 7.5	
LATLONG: 46310N1171010W	
COUNTY: WHITMAN	
PROVINCE: CB	
SPECIAL STATUS: A	
VERIFICATION: V	
SURVEY: A	
NAME: SILENE SPALDINGII 014	
INDEX CODE: JN.L76	
OWNERSHIP CODE: PVTPIN	
NUMBER OF OWNERS: .	
NAME OF OWNER: .	
FEDERAL STATUS: C2	
STATE STATUS: SPT	
STATE RANK: S2	
NAME OF AREA:	
AGENCY SUBSECTION:	
SOURCE OF LEAD: AUGENSTEIN, EJ (MJAB177,002) 1983 (1 PREV COLL, 1980)	
GENERAL DESCRIPTION: PLTS CEMETARY. 29 PLS SEEN IN SE & N PTS OF AREA, UP FROM 12 IN 1981. PLS SCATTERED, 1-2 STEMS EA, SEEM HEALTHY. FLD-SYAL HT, W INTRO SHRUBS & TREES, & SOME AREAS QUITE WEEDY. SISP MOSTLY OCCURS IN NON-WEEDY VEG, BUT 1 GROUP IN INTRO EUPH	
DATA POINT: 25	
DATE OF ENTRY: 8528	
ASPECT: D	
DATE REVISITATION: 81E	
PRECISION: C	
THREAT: .	
SIZE: .	
EO RANK: C	
PROTECTION STATUS: 2	
TR: T16N R45E S32	
QUADCODE: 4611772	
QUADRANGLE: ALBION 7.5	
LATLONG: 465013N1170935W	
COUNTY: WHITMAN	
PROVINCE: CB	
SPECIAL STATUS: REG	
VERIFICATION: V	
SURVEY: A	
NAME: SILENE SPALDINGII 015	
INDEX CODE: JN.L76	
OWNERSHIP CODE: PVTUUU	
NUMBER OF OWNERS: .	
NAME OF OWNER: .	
FEDERAL STATUS: C2	
STATE STATUS: SPT	
STATE RANK: S2	
NAME OF AREA:	
AGENCY SUBSECTION:	
SOURCE OF LEAD: BARRETT J 1981B MJAB244 001 (1 PREV COL, 1980)	
GENERAL DESCRIPTION: AUG 24. 15 PLS, CA 3 ACRES. ON HILLSIDE E OF BERRY L, 2MI SW OF LANONT. PLAIN TO THE E IS WEEDY, UNCULT.; HILLTOP CULT. EL 2100-2200FT, ASP W-MM, SL 30DEG, SLOPE HAS MOSAIC OF WEEDY VEG AND GOOD VEG. SILENE GROWS MOSTLY IN GOOD VEG,	
DATA POINT: 5	
DATE OF ENTRY: 8150	
ASPECT: B	
DATE REVISITATION: 81E	
PRECISION: C	
THREAT: .	
SIZE: .	
EO RANK: CD	
PROTECTION STATUS: .	
TR: T19N R39E S06	
QUADCODE: 4711723	
QUADRANGLE: LANONT NW 7.5	
LATLONG: 471032N1175650W	
COUNTY: WHITMAN	
PROVINCE: CB	
SPECIAL STATUS: .	
VERIFICATION: V	
SURVEY: A	

Table 3. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM  
SILENE SPALDINGII RECORDS  
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 016	INDEX CODE: JN.L76	OWNERSHIP CODE: DNRPVTS	NUMBER OF OWNERS: 2	NAME OF OWNER: E HARLAND HOOD	FEDERAL STATUS: C2	STATE STATUS: SPT	STATE RANK: S2	NAME OF AREA:	AGENCY SUBSECTION:	SOURCE OF LEAD: KRATZ A	GENERAL DESCRIPTION: ON STEEP N-FACING SLOPE OVERLOOKING CONNER GULCH, IDAHOensis HT. GRAZED: HYPERICUM PERFORIATUM, BRONUS TECTORUM, SISYMYRUM ALTISSIMUM, EPILOBIUM PANICULATUM, NO HAPLOAPPUS LIATRIFORMIS. HEUCHERA, GERT.	DATE: 198009	SITE REVISITATION: C	PRECISION: C	THREAT: NDS REGION: 1	ELEVATION: DNR REGION: B	ASPECT: B	SIZE: EO RANK: BC	PROTECTION STATUS: 2	TRNS: T10N R44E S15	QUADCODE: 4611733	QUADNAME: POTTER HILL 7.5	LATLNG: 462022N1171725W	COUNTY: ASOTIN	PROVINCE: CB	SPECIAL STATUS: REG	PROTECTION STATUS: 2
NAME: SILENE SPALDINGII 017	INDEX CODE: JN.L76	OWNERSHIP CODE: DNRPVTS	NUMBER OF OWNERS: 2	NAME OF OWNER: E HARLAND HOOD	FEDERAL STATUS: C2	STATE STATUS: SPT	STATE RANK: S2	NAME OF AREA:	AGENCY SUBSECTION:	SOURCE OF LEAD: KRATZ A	GENERAL DESCRIPTION: ON STEEP N-FACING SLOPE OVERLOOKING CONNER GULCH, APPEARS TO BE MUCH HABITAT FOR S SPALDINGII BCSE OF LG AREA OF STEEP N SLOPES, ASPECT N-SLIGHTLY NW, MOST CONNO N WITH FESTUCA (& GEUM HEUCHERA BESSEYEA HIERACIUM), ALSO OCCURS WHERE... SEPOL	DATE: 198009	SITE REVISITATION: C	PRECISION: C	THREAT: NDS REGION: 1	ELEVATION: DNR REGION: B	ASPECT: B	SIZE: EO RANK: BC	PROTECTION STATUS: 2	TRNS: T10N R44E S21	QUADCODE: 4611733	QUADNAME: POTTER HILL 7.5	LATLNG: 462013N1171752W	COUNTY: ASOTIN	PROVINCE: CB	SPECIAL STATUS: REG	PROTECTION STATUS: 2
NAME: SILENE SPALDINGII 018	INDEX CODE: JN.L76	OWNERSHIP CODE: ST USA	NUMBER OF OWNERS: 1	NAME OF OWNER: WSU	FEDERAL STATUS: C2	STATE STATUS: SPT	STATE RANK: S2	NAME OF AREA: SMOOTH HILL BSA	AGENCY SUBSECTION:	SOURCE OF LEAD: BARRETT J 1981B MJAB177 003	GENERAL DESCRIPTION: AUG 26, SMOOTH HILL BIOLOGICAL RESERVE, N-SLOPE OF SMOOTH HILL, ABOVE FOURMILE CR, NEAR JCT OF FOURMILE CR AND ROSE CR, 4 PLTS IN SMALL GROUP, SEVERAL SQ METER S. EL 2500FT, SL 30DEG, ASP N. SOIL DEEP, DARK, FINE, 0.5IN LITTER. VEG: SOME-	DATE: 198108	SITE REVISITATION: C	PRECISION: C	THREAT: NDS REGION: 1	ELEVATION: DNR REGION: B	ASPECT: DC	SIZE: EO RANK: DC	PROTECTION STATUS: 2	TRNS: T16N R44E S35	QUADCODE: 4611772	QUADNAME: ALBION 7.5	LATLNG: 464942N1171322W	COUNTY: WILTON	PROVINCE: CB	SPECIAL STATUS: BSAFRS	PROTECTION STATUS: 2
NAME: SILENE SPALDINGII 019	INDEX CODE: JN.L76	OWNERSHIP CODE: ST USA	NUMBER OF OWNERS: 1	NAME OF OWNER: WSU	FEDERAL STATUS: C2	STATE STATUS: SPT	STATE RANK: S2	NAME OF AREA: SMOOTH HILL BSA	AGENCY SUBSECTION:	SOURCE OF LEAD: BARRETT J 1981B MJAB177 003	GENERAL DESCRIPTION: AUG 26, SMOOTH HILL BIOLOGICAL RESERVE, N-SLOPE OF SMOOTH HILL, ABOVE FOURMILE CR, NEAR JCT OF FOURMILE CR AND ROSE CR, 4 PLTS IN SMALL GROUP, SEVERAL SQ METER S. EL 2500FT, SL 30DEG, ASP N. SOIL DEEP, DARK, FINE, 0.5IN LITTER. VEG: SOME-	DATE: 198108	SITE REVISITATION: C	PRECISION: C	THREAT: NDS REGION: 1	ELEVATION: DNR REGION: B	ASPECT: DC	SIZE: EO RANK: DC	PROTECTION STATUS: 2	TRNS: T16N R44E S35	QUADCODE: 4611772	QUADNAME: ALBION 7.5	LATLNG: 464942N1171322W	COUNTY: WILTON	PROVINCE: CB	SPECIAL STATUS: BSAFRS	PROTECTION STATUS: 2

Table 3. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM  
SILENE SPALDINGII RECORDS  
DATA CURRENT AS OF NOVEMBER 1986

NAME: SILENE SPALDINGII 819  
 INDEX CODE: JN.L76  
 OWNERSHIP CODE: PVTNUU  
 NUMBER OF OWNERS: 1  
 NAME OF OWNER:  
 FEDERAL STATUS: C2  
 STATE STATUS: SPT  
 STATE RANK: S2  
 NAME OF AREA:  
 AGENCY SUBSECTION:  
 SOURCE OF LEAD: BARRETT J 1981B NJAB250,005  
 GENERAL DESCRIPTION: AUG 27. 9 PLTS ON 0.5 ACRES. ON LOW SLOPE JUST ABOVE THE JOHNSON-PULLMAN RD, ON  
 VERY SMALL PATCH OF PRARIE VEG, NEXT TO GRAVEL PIT. CA 3HI S OF PULLMAN. SL 20  
 DEG, ASP NE, EL 2440FT. SOIL MOD DEEP, OVER BASALT, DARK, FINE. FEID-SYAL HT,...  
 PHOTOS: DIRECTIONS: VERIFICATION: V  
 DATA POINT: 27 ELEVATION: 2 SURVEY: REFERENCES: A  
 DATE OF ENTRY: 8217 ASPECT: DNR REGION: 2  
 DATE OF ENTRY: 8217 BOUNDARIES: DNR REGION: 2

Table 3. (cont.)

## Oregon Occurrence Record

NAME: *SILENE SPALDINGII*  
 COMMON NAME: SPALDING'S CAMPION  
 EO-CODE: PDCA00150, 002  
 COUNTY NAMES: UMAT  
 T-R-S: 0026030E 36  
 TRS COMM: SE4SE4  
 QUAD NAMES: GURDANE  
 FEDERAL STAT: O2 STATE STAT: ORCUGGASBFOA1  
 COMMUNITY: 1  
 EO-RANK/COMM: 1  
 DIRECTIONS: DARR FLAT. 7 MI. S OF JUNCTION OF 395 & 74 (NYE JUNCTION),  
 ON W SIDE OF 395. JUST W OF ROAD LEADING IN THE SW SIDE OF  
 DARR FLAT.  
 DESCRIPTION: NORTH FACING HILLSIDE, DOMINATED BY FEID, HIDY, KOCR IN  
 EXCELLENT CONDITION. A FEW ABSP & POSAB PLANTS PRESENT ON  
 SLOPE.  
 EO DATA: A PLANTS OBSERVED IN FLOWER. PLANTS APPEARED HEALTHY, BUT NO  
 OTHER PLANTS WERE LOCATED. HAS SMALL WHITE PETALS, BUT THESE  
 WERE SLIGHTLY LARGER THAN TYPICAL S. SPALDINGII (SMALLER THAN S. OREGONIA). BLOOMED EARLIER THAN IS TYPICAL.  
 COMMENTS: K. CHAMBERS ANNOTATED COLLECTION AT DSC (#6268301-PART OF 1.  
 PLANT), TO S. SPALDINGII. KAGAN FEELS THIS MAY BE A HYBRID.  
 OWNER: CUNNINGHAM SHEEP COMPANY (PVT)  
 OWNER COMM:  
 PROT COMM: SITE IS HIGH PRIORITY FOR TNC PROTECTION  
 MANAGE COMM:  
 BEST SOURCE: J. KAGAN, TNC FIELD SURVEY. COLLECTION #: 6288301, DSC

Table 4. Populations known or assumed extirpated.

## Washington Occurrence Record

WASHINGTON NATURAL HERITAGE DATA SYSTEM	
SILENE SPALDINGII RECORDS	
DATA CURRENT AS OF NOVEMBER 1988	
NAME: SILENE SPALDINGII 002	INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUAPS	
NUMBER OF OWNERS: 1	DATE: 195109
NAME OF OWNER: WSU	SITE VISITATION: 81C
FEDERAL STATUS: C2	PRECISION: G
STATE STATUS: SPT	THREAT:
STATE RANK: S2	SIZE:
NAME OF AREA: DAUGENMIRE RE 518	EO RANK: .
AGENCY SUBSECTION: DAUGENMIRE RE 518	
SOURCE OF LEAD: DAUGENMIRE RE 518	
GENERAL DESCRIPTION: W EDGE FULLMAN IN THICKET OF CRATAGEUS:SYNPHORICARPIUS.	
DATA POINT: 3	WDG REGION: 1
DATE OF ENTRY: 7940	DNR REGION: .
SEP	DIRECTIONS: .
ELEVATION: .	BOUNDARIES: .
ASPECT: .	
	PHOTOS: .
	VERIFICATION: V
	REFERENCES: .

Table 4. (cont.)

## Montana

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U150.006  
 NAME: SILENE SPALDINGII  
 COMNAME: SPALDING CAMPION  
 MARGINUM: 2 TENTEN: 7,1 IDENT: Y EORANK:  
 SURVEYSITE: COLUMBIA FALLS  
 EORANKCOMM:  
 SURVEYDATE: 1894-08-10 LASTOBS: 1894-08-10 FIRSTOBS: 1894 GRANK: G2  
 SRANK: S1 STATE: MT COUNTYNAME: MTFLAT  
 QUADCODE: 4811432 4811442  
 QUADNAME: COLUMBIA FALLS S., COLUMBIA FALLS N. PRECISION: G  
 LAT: 482230 LONG: 1141020 S: Ø N: Ø E: Ø W: Ø  
 TOWNRANGE: 030N020W SECTION: 09 MERIDIAN: PR TRSCOMM: SW4  
 PHYSPROV: NR WATERSHED: 17010208 RIVERREACH: 1701020801600.00  
 DIRECTIONS: COLUMBIA FALLS.

## GENDESC:

ELEV: 3000 SIZE: Ø  
 EODATA:

COMMENTS: OLD COLLECTION, NOT RELOCATED; RM SPECIMEN VERIFIED BY B.  
           MAGUIRE & C.L. HITCHCOCK, 1942-03-24.  
 MACODE1: PRIVATEOWNMTUS CONTAINED1: ? MACODE2: CONTAINED2:  
 MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:  
 MOREMGMT: Z SITECODE:  
 SITENAME:  
 OWNER:  
 OWNERCOMM:  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR: MONITORNUM: -  
 BESTSOURCE: WILLIAMS, R.S. (995), 1894, MONTU, RM(24349).  
 SOURCECODE: S94WILUMMTUS S94WILRMMTUS  
 DATASENS: BOUNDARIES: N PHOTOS: N OWNERINFO: N  
 TRANSCRIBR: 86-02-06 JSS CDREV: Y MAPPER: 86-02-06 JSS QC: Y  
 UPDATE: 86-02-24 LWS

Table 5. Historically known populations where current status is not known.

ELEMENT OCCURRENCE CODE: PDCAR0U1S0.002  
 NAME: SILENE SPALDINGII  
 COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE  
 MARGNUM: 1 TENTEN: IDENT: Y EORANK:  
 EORANKCOMM:  
 SURVEYDATE: LASTOBS: FIRSTOBS: GRANK: G2  
 SURVEYSITE: DAUBIE'S STAND 162  
 SRANK: S1 STATE: ID COUNTYNAME: IDLEWI  
 QUADCODE: 4611626  
 QUADNAME: WINCHESTER WEST PRECISION: M  
 LAT: 461435 LONG: 1163803 S: 461400 N: 461530 E: 1163700 W: 1163830  
 TOWNRANGE: 034N002W SECTION: 31 MERIDIAN: BO  
 TRSCOMM: WATERSHED: 17060306  
 DIRECTIONS: SOMEWHERE NEAR TOWN OF WINCHESTER, ABOUT 2 MILES WEST OF  
 U.S. HWY 95.  
 GENDESC: NO DATA

ELEV: 4000 SIZE: 0  
 EODATA: DAUBENMIRES'S FESTUCA IDAHOENSIS-ROSA SPP. ASSOCIATION.  
 STAND 162: PRESENT WITH 2% FREQUENCY.

COMMENTS: TABLE B-5 IN B70DAU01.

MACODE1: CONTAINED1: MACODE2: CONTAINED2:  
 MACODE3: CONTAINED3: ADDLMAS:  
 MORELAND: MOREPROT: MOREMGMT: SITECODE:  
 SITENAME:  
 OWNER:  
 OWNERCOMM: PRIVATE, PERHAPS NEZ PERCE INDIAN RESERVATION  
 PROTCOMM:  
 MGMTCOMM:  
 MONITOR: MONITORNUM:  
 BESTSOURCE: Daubenmire, R. 1970. Steppe Vegetation of Washington. Exp  
 Tech Bull 62.  
 SOURCECODE: B70DAU01IDUS PNDCAI01IDUS

DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO: N  
 TRANSCRIBR: 84-10-18 SLC CDREV: Y MAPPER: 84-10-18 SLC QC: Y  
 UPDATE: 88-11-07 PJP

## Washington Occurrence Records

NAME: SILENE SPALDINGII 003 INDEX CODE: JN.L76	DATA POINT: 2 DATE OF ENTRY: 7940	ELEVATION: ASPECT:	JUN MDS REGION: 1 DNR REGION:	DIRECTIONS: BOUNDARIES:	PHOTOS: SURVEY:	VERIFICATION: V REFERENCES:
OWNERSHIP CODE: PVTUUU NUMBER OF OWNERS: . NAME OF OWNER: . FEDERAL STATUS: C2 STATE STATUS: SPT STATE RANK: S2 NAME OF AREA: AGENCY SUBSECTION: GENERAL DESCRIPTION: HILL S WINONA.	DATE: 192506 SITE VISITATION: PRECISION: G THREAT: SIZE: . EO RANK: .	TR: T17N R40E S32 QUADCODE: 4611787 QUADNAME: WINONA, 7.5 LATLONG: 465505N117480W COUNTY: WHITMAN PROVINCE: CB SPECIAL STATUS: PROTECTION STATUS: .	TR: T24N R40E S28 QUADCODE: 4711757 QUADNAME: WAUKON 7.5 LATLONG: 473255N117462E COUNTY: SPOKANE PROVINCE: CB SPECIAL STATUS: PROTECTION STATUS: .	DATE: 1900 SITE VISITATION: PRECISION: G THREAT: SIZE: . EO RANK: .	TR: T24N R40E S28 QUADCODE: 4711757 QUADNAME: WAUKON 7.5 LATLONG: 473255N117462E COUNTY: SPOKANE PROVINCE: CB SPECIAL STATUS: PROTECTION STATUS: .	TR: T24N R40E S28 QUADCODE: 4711757 QUADNAME: WAUKON 7.5 LATLONG: 473255N117462E COUNTY: SPOKANE PROVINCE: CB SPECIAL STATUS: PROTECTION STATUS: .
NAME: SILENE SPALDINGII 004 INDEX CODE: JN.L76	DATA POINT: 1 DATE OF ENTRY: 7940	ELEVATION: ASPECT:	NONE MDS REGION: 1 DNR REGION:	DIRECTIONS: BOUNDARIES:	PHOTOS: SURVEY:	VERIFICATION: V REFERENCES:
OWNERSHIP CODE: PVTUUU NUMBER OF OWNERS: . NAME OF OWNER: . FEDERAL STATUS: C2 STATE STATUS: SPT STATE RANK: S2 NAME OF AREA: AGENCY SUBSECTION: GENERAL DESCRIPTION: TUCKER PRAIRIE, 12MI N CHENEY.	DATE: 1900 SITE VISITATION: PRECISION: G THREAT: SIZE: . EO RANK: .	GENERAL DESCRIPTION: TUCKER PRAIRIE, 12MI N CHENEY.	GENERAL DESCRIPTION: TUCKER PRAIRIE, 12MI N CHENEY.	GENERAL DESCRIPTION: TUCKER PRAIRIE, 12MI N CHENEY.	GENERAL DESCRIPTION: TUCKER PRAIRIE, 12MI N CHENEY.	GENERAL DESCRIPTION: TUCKER PRAIRIE, 12MI N CHENEY.

Table 5. (cont.)

- c. **Washington:** Sites (003) and (004) are old records that have not been revisited; their current status is not known (p. 39).
- 4. **Locations not yet investigated believed likely to support additional natural populations.** A majority of the appropriate habitat in Montana has been surveyed for this species. However, a study of population sizes (see Appendix A, p. 68, (Lesica, 1988) and the 1988 surveys have revealed much-reduced plant numbers for several known populations, and no plants apparent at some of the small subpopulations. This trend may be due to natural fluctuations in populations of this plant, and/or to the current drought conditions. It is possible that sites were not found during 1988 owing to these conditions.
- 5. **Reports having ambiguous or incomplete locality information:** See Table 6, pp. 41-42, for detailed occurrence records on the following sites.
  - a. **Montana:** The Niarada (007) site has never been relocated. The specimen has been verified but the site description on the label does not describe a habitat where S. spaldingii is usually found in Montana. This label is believed to be incorrect, and the site may actually be one of the known populations in the vicinity of Niarada.
  - b. **Oregon:** Collections were first made at the Wallowa Lake site (001) in 1898 by Cusick. In 1980, Bonnie Heidel recorded the presence of this species and took photographs. No collection was made at the time (Bonnie Heidel, pers. comm.). Subsequently, this area was searched but the population was not relocated (Jimmy Kagan, pers. comm.).  
It is also possible that this species is hybridizing in this area, as collections reveal certain morphological disparities with descriptions in the literature (Jimmy Kagan, pers. comm.). The status of this population is currently in question.

## Montana

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.007

NAME: SILENE SPALDINGII

COMMONNAME: SPALDING CAMPION

MARGNUM: 1 TENTEN: 2,9 IDENT: Y EORANK:

SURVEYSITE: NIARADA

EORANKCOMM:

SURVEYDATE: 1974-06-26 LASTOBS: 1974-06-26 FIRSTOBS: 1974 GRANK: G2  
SRANK: S1 STATE: MT COUNTYNAME: MTSAND

QUADCODE: 4711475

QUADNAME: NIARADA

PRECISION: G

LAT: 474556 LONG: 1143632 S: Ø N: Ø E: Ø W: Ø  
TOWNRANGE: 023N024W SECTION: 12 MERIDIAN: PR TRSCOMM:PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 1701021206000.00  
DIRECTIONS: FLATHEAD INDIAN RESERVATION, 11 MI. N. OF HOT SPRINGS JCT.

ON HWY. 28, CA. 40 AIR MI. S-SW OF KALISPELL.

GENDESC: BASIC SILTY CLAY SOIL; MIXED ARTEMISIA GRASSLAND, WITH STIPA  
COMATA THE DOMINANT GRASS.

ELEV: 2850 SIZE: Ø

EODATA: UNKNOWN; THIS LOCATION HAS BEEN SEARCHED FOR, BUT NOT FOUND;  
ACCORDING TO P. LESICA, SPECIMEN MAY BE MISLABELED, SINCE  
HABITAT DESCRIPTION IS UNUSUAL FOR THE SPECIES.

COMMENTS: SPECIMEN VERIFIED BY P.F. STICKNEY, 1979.

MACODE1: FBIIRFLAT1MTUS CONTAINED1: Y MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:

MOREMGMT: Z SITECODE:

SITENAME:

OWNER:

OWNERCOMM:

PROTCOMM:

MGMTCOMM:

MONITOR: MONITORNUM: -

BESTSOURCE: LAN, D. (74-63), 1974, MONTU (076172), MISSOULA, MT.

SOURCECODE: S74LANUMMTUS PNDLESØ1MTUS

DATASENS: BOUNDARIES: PHOTOS: N OWNERINFO: N

TRANSCRIBR: 86-03-12 JSS CDREV: Y MAPPER: 86-03-12 JSS QC: Y

UPDATE: 86-04-04 LWS

Table 6. Reports having ambiguous or incomplete locality information.

## Oregon Occurrence Record

NAME: *SILENE SPALDINGII*  
 COMMON NAME: SPALDING'S CAMPION  
 EO-CODE: PDCA00180, 001  
 COUNTY NAMES: WALL  
 T-R-S: 0026045E 32  
 TRS COMM: SW4 SE4 S32  
 QUAD NAMES: JOSEPH 15  
 FEDERAL STAT: D2 STATE STAT:  
 COMMUNITY:  
 EO-RANK/COMM: \*  
 DIRECTIONS: NE OF WALLOWA LAKE; DRY LANDS OF THE WALLOWA REGION; WALLOWA VALLEY AND IMNAHA; WALLOWA VALLEY NEAR THE LAKE.  
 DESCRIPTION: GRAZED HILLSIDE WITH FESTUCA, AGROPYRON.  
  
 EO DATA: BONNIE HEIDEL 1980 SIGHTING NE OF WALLOWA LAKE. OTHER COLLECTIONS IN THIS GENERAL AREA INCLUDE CUSICK 8/28/98 ORE, CUSICK 8/22/98 OBC #2004, CUSICK 8/86 NEV #970.  
  
 COMMENTS: HEIDEL SIGHTING AT WALLOWA LAKE IS ONE OF ONLY TWO RECENT ONES IN OREGON FOR SPECIES. MORE SEARCHING NEEDED NEAR LAKE.  
 OWNER: PRIVATE  
 OWNER COMM:  
 PROT COMM:  
 MANAGE COMM:  
 BEST SOURCE: HEIDEL B. 1980. UEPWB END SPECIES STATUS REPORT; HEIDEL NOW WORKS WITH NORTH DAKOTA NATURAL HERITAGE PROGRAM.

Table 6. (cont.)

6. **Locations known or suspected to be erroneous reports:** See Table 7, pp. 44-46, for detailed occurrence records and information on the following site.

a. **Idaho:** Although not yet verified, the Rock Flats (003) site is believed to actually be located near Macall in Adams County, Washington. The original specimen label appears to have been misinterpreted.

C. **Biogeographical and phylogenetic history:** Silene spaldingii is associated with Palouse prairie. The soils supporting these communities were deposited approximately 15,000 years ago through multiple flood releases of Glacial Lake Missoula and Glacial Lake Kootenai (Alt and Hyndman, 1986). Soils and debris were deposited from Montana across Idaho and into Washington and Oregon. It is possible that this species evolved after the soils were deposited or it may have migrated into these areas after the waters had receded.

6. **General environment and habitat description.**

A. **Concise statement of general environment and habitat:** Silene spaldingii is restricted to Festuca idahoensis habitat types and phases throughout its range (Heidel, 1980). These areas are also often referred to as Palouse prairie. Populations in Montana occur most often on north- to east-facing slopes, in or along small drainages (without running water) or in swales. Soils are silty loams, moderately deep and sometimes gravelly. These sites often occur along the lower treeline, or near scattered trees. The vegetation is dominated by grasses (Festuca scabrella (rough fescue) and Festuca idahoensis (Idaho fescue)) with scattered shrubs (Rosa woodsii (woods rose)). In Montana, S. spaldingii occurs at elevations of 2,700-3,500 feet. The slopes where it occurs are likely to catch and maintain snow throughout the winter.

B. **Physical characteristics.**

1. **Climate.**

a. **Koppen climate classification:** Type Dfb, a Canadian climate with snowy winters and moderately warm summers, with needle-leaved trees in the north (Visher, 1954).

ELEMENT OCCURRENCE CODE: PDCAROU1SO.003  
NAME: SILENE SPALDINGII  
COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE  
MARGNUM: 1 TENTEN: IDENT: Y EORANK:  
EORANKCOMM:  
SURVEYDATE: LASTOBS: 1946-06-24 FIRSTOBS: 1946 GRANK: G2  
SURVEYSITE: ROCK FLATS  
SRANK: S1 STATE: ID COUNTYNAME: IDADAM  
QUADCODE: 4411682  
QUADNAME: MEADOWS PRECISION: M  
LAT: 445600 LONG: 1161000 S: 445500 N: 445700 E: 1160930 W: 1161100  
TOWNRANGE: 018N002E SECTION: 01 MERIDIAN: BO  
TRSCOMM: OR ADJACENT SECTIONS WATERSHED: 17060210  
DIRECTIONS: 2 MILES WEST OF MACALL (SIC).

GENDESC: IN DEEP GRASS

ELEV: 5120 SIZE: 0  
EODATA:

COMMENTS: R.G. JEFFREY S.N. (LABEL SAYS WA, BUT NO MACALL IN ADAMS CO,  
WA; MAPPED AT ROCK FLATS TO MINUTES, MAYBE BETTER AS GENERAL  
MACODE1: CONTAINED1: MACODE2: CONTAINED2:  
MACODE3: CONTAINED3: ADDLMAS:  
MORELAND: MOREPROT: MOREMGMT: SITECODE:  
SITENAME:  
OWNER:  
OWNERCOMM: PRIVATE AS MAPPED  
PROTCOMM:  
MGMTCOMM:  
MONITOR: MONITORNUM:  
BESTSOURCE: JOHNSON, FRED  
SOURCECODE: PNDJOH01IDUS PNDCAI01IDUS

DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO: N  
TRANSCRIBR: 84-10-18 SLC CDREV: Y MAPPER: 84-10-18 SLC QC: Y  
UPDATE:

Table 7. Location known or suspected to be an erroneous report.  
(See also information on next page.)

## Washington

NATURAL HERITAGE DATA SYSTEM LCD ELEMENT OCCURRENCE FORM												WASHINGTON NATURAL HERITAGE PROGRAM WASHINGTON DEPT. OF GAME, NONNAME PROGRAM												GMF																																																											
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MACALL QUADRANGLE  
WASHINGTON—ADAMS CO.  
MINUTE SERIES (TOPOGRAPHIC)

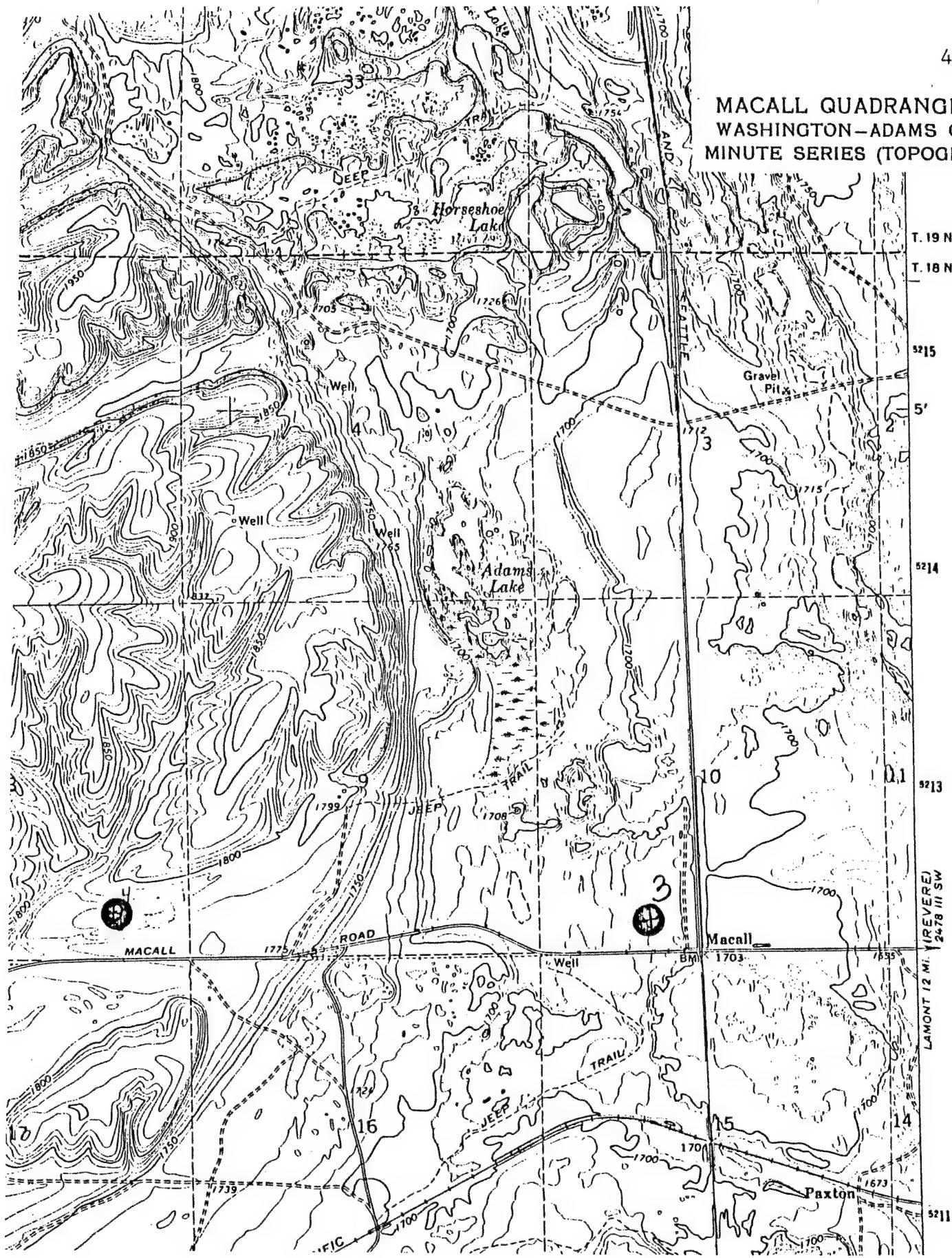


Table 7. (cont.)

- b. **Regional macroclimate:** The climatic recording station nearest to the Tobacco Valley sites is located at Fortine, at an elevation of 2,951 feet, approximately 17 miles south of the sites. For the 30-year period ending in 1980, mean July maximum and mean January minimum temperatures were  $82.2^{\circ}\text{F}$  and  $11.5^{\circ}\text{F}$ , respectively. Mean annual precipitation was 17.25 inches. Polson Kerr Dam, at an elevation of 2,931 feet, is approximately 23 mile south and east of the sites near Niarada, and approximately 12 miles south of the Wild Horse Island site. For the 30-year period ending in 1980, mean July maximum and mean January minimum temperatures were  $82.3^{\circ}\text{F}$  and  $17.9^{\circ}\text{F}$ , respectively. Mean annual precipitation was 14.98 inches (U.S. Department of Commerce, 1982).
- c. **Local microclimate:** Silene spaldingii appears to occur on north- to east-facing slopes and in swales, in areas where snow deposition is likely. These sites may hold moisture longer into the spring.
2. **Air and water quality requirements:** Unknown.
3. **Physiographic province:** Hunt (1974) places the range of S. spaldingii in Montana in the Rocky Mountains of Montana and Canada Province, within the Rocky Mountain System.
4. **Physiographic and topographic characteristics:** In Montana, S. spaldingii occurs on alluvial or eolian soils. These soils were deposited by Glacial Lake Missoula, which formed during the advance of the Cordilleran ice sheet that blocked several major drainages in northwest Montana. Repeated breaking of the ice dam caused numerous catastrophic floods (Alt and Hyndman, 1986). Depositional materials extend across Idaho and into Washington and Oregon, and are likely to underlie the S. spaldingii populations in these states as well.
- Populations often occur on moderate slopes in swales and drainages. In Montana, the known sites occur from 2,700-3,500 feet in elevation.

5. **Edaphic factors:** Silene spaldingii occurs on loamy soils which are sparsely gravelly. These soils are very productive, and much of the area in Montana, Idaho, Oregon, and Washington where they occur has been converted for agricultural uses or grazing.
6. **Dependence of this taxon on natural disturbance:** None known.
7. **Other unusual physical features:** None observed.

C. **Biological characteristics.**

1. **Vegetation physiognomy and community structure:** In Montana, S. spaldingii occurs mostly in well-preserved grasslands, at the edges of the lower treeline or near scattered trees. These forested areas are composed principally of Pinus ponderosa (ponderosa pine) and/or Pseudotsuga menziesii (Douglas fir). The most common shrub associate was Rosa woodsii (woods rose). Festuca idahoensis (Idaho fescue), Festuca scabrella (rough fescue) and Stipa occidentalis (western needlegrass) are the primary grass associates; however, in areas that have been grazed Poa pratensis (Kentucky bluegrass) has become dominant.
2. **Regional vegetation types:** Ross and Hunter (1976) place the Tobacco Valley sites in the Foothills and Mountains Silty Range Site, 15-19 inch precipitation zone, and list as dominants rough fescue, Idaho fescue, Columbia needlegrass etc. They place the Niarada site in the Foothills and Mountains Silty Range Sites, 10-14 inch precipitation zone, and list as dominants bluebunch wheatgrass, rough fescue, needle-and-thread etc.. Kuchler (1964) places both the Tobacco Valley sites and the Niarada sites in the Western Ponderosa Forest, described as medium to open forest of tall needleleaf evergreen trees with a fairly open ground cover of grasses and occasional shrubs. The Mueggler and Stewart (1980) grassland classification scheme places the S. spaldingii sites in the Festuca scabrella / Festuca idahoensis habitat type.
3. **Frequently associated species:** In Montana, associated species include:

Agropyron smithii Rydb.  
Agropyron spicatum (Pursh) Scrib. & Smith  
Festuca idahoensis Torrey ex Hook.  
Festuca scabrella Elmer  
Lithospermum ruderale Dougl. ex Lehm.  
Pinus ponderosa Dougl. ex Laws. & Laws.  
\* Poa pratensis L.  
Poa secunda Presl.  
Pseudotsuga menziesii (Mirb.) Franco  
Rosa woodsii Lindl.  
Stipa comata Thurb. ex Wats.  
Stipa occidentalis Trin. & Rupr.

\* = introduced species

4. **Dominance and frequency of the taxon:** In Montana, populations are variable in size, and range from 10 plants up to 10,000 plants. The mean population size is ca. 1300; however, of the eight currently known sites, six have 100 or fewer plants. Canopy coverage of this species is generally quite low except in very localized areas. Most populations consist of scattered individual plants.
5. **Successional phenomena:** Silene spaldingii is associated with successional advanced fescue grasslands. The species appears to tolerate moderate grazing that results in an increase of Poa pratensis at some sites in Montana (Peter Lesica, pers. comm.). However, it is suspected that a population has been extirpated in the state of Oregon as a result of overgrazing (Jimmy Kagan, pers. comm.).
6. **Dependence on dynamic aspects of biotic associations and ecosystem features:** Unknown.
7. **Other endangered, threatened, rare, or vulnerable species occurring in habitat of this taxon:** The following species is found in the vicinity of the Tobacco Valley sites. This bird is known to have a limited distribution in Montana, but is more widespread elsewhere.

Tympanuchus phasianellus columbianus  
(Columbian sharp-tailed grouse) - listed  
as "critically endangered" in Montana (S1)  
by The Montana Natural Heritage Program.

Nests of the following species are found on Wild Horse Island near the S. spaldingii sites.

Haliaeetus leucocephalus (bald eagle) - listed as "endangered" in Montana (S2) by The Montana Natural Heritage Program.

## 7. Population biology of the taxon.

A. General summary: Ten populations of Silene spaldingii occur in northwest Montana in Palouse prairie areas. Populations are separated by approximately 88 miles. The largest population occurs in the Tobacco Valley, and consists of 10,000 plants in two subpopulations. The largest population in the Niarada/Flathead Lake vicinity contains 250 plants. Other populations have less than 100 plants, and most have less than 30. Silene spaldingii is thought to be an obligate or near-obligate outcrossing species (Lesica, 1988); see Appendix C, p. 70, for more detailed information. Bumblebees (Bombus sp.) are among the known pollinators (Lesica, 1988); see Appendix C.

## B. Demography.

1. Known populations: There are currently eight known populations of S. spaldingii in Montana: two populations in the Tobacco Valley (Lincoln County), five in the vicinity of Niarada, Montana (Sanders and Flathead counties), and one on Wild Horse Island in Flathead Lake (Lake County). This species is also currently known from fifteen sites in Washington and two in Idaho.

## 2. General demographic details (Montana):

- a. Dancing Prairie-Tobacco Plains South (001)
1. Area occupied by population: ca. 200 acres.
  2. Estimated number of individuals: ca. 10,000 plants in three subpopulations.
  3. Density: Very localized areas have a fairly dense cover of plants; however most are scattered individuals.
  4. Presence of dispersed seeds: Unknown.
  5. Evidence of reproduction: Flowering and fruiting plants and seed production; see (Lesica, 1988), Appendix B, p. 69.

6. **Evidence of population expansion or decline:** Population has declined over the one-year period 1987-1988 (Lesica, 1988); Appendix B, p. 69.
- b. **Wild Horse Island State Park (002)**
  1. **Area occupied by population:** ca. 10 acres.
  2. **Estimated number of individuals:** ca. 125-250 plants in three subpopulations.
  3. **Density:** Scattered.
  4. **Presence of dispersed seeds:** Unknown.
  5. **Evidence of reproduction:** Flowering and fruiting plants; see (Lesica, 1988), Appendix A, p. 68.
  6. **Evidence of population expansion or decline:** Population has declined over the two-year period 1986-1988 (Lesica, 1988); Appendix A, p. 68.
- c. **Black Bear Ranch (003)**
  1. **Area occupied by population:** ca. 10 acres.
  2. **Estimated number of individuals:** ca. 30 plants.
  3. **Density:** Scattered.
  4. **Presence of dispersed seeds:** Unknown.
  5. **Evidence of reproduction:** Flowering plants observed.
  6. **Evidence of population expansion or decline:** None.
- d. **Mill Pocket Ridge (004)**
  1. **Area occupied by population:** ca. 20 acres.
  2. **Estimated number of individuals:** Seven flowering plants observed in 1983.
  3. **Density:** Scattered.
  4. **Presence of dispersed seeds:** Unknown.
  5. **Evidence of reproduction:** Flowering plants observed.
  6. **Evidence of population expansion or decline:** None.
- e. **Crosson Valley (005)**
  1. **Area occupied by population:** ca. 30 acres.
  2. **Estimated number of individuals:** 100+ plants in 5 subpopulations.
  3. **Density:** Scattered.

4. **Presence of dispersed seeds:** Unknown.
  5. **Evidence of reproduction:** Flowering plants observed.
  6. **Evidence of population expansion or decline:** Site was revisited in 1988, but subpopulations were not found or were much reduced in size.
- f. **Eureka North (008)**
1. **Area occupied by population:** ca. 2+ acres.
  2. **Estimated number of individuals:** 10 + plants in two subpopulations.
  3. **Density:** Scattered.
  4. **Presence of dispersed seeds:** Unknown.
  5. **Evidence of reproduction:** Flowering plants observed.
  6. **Evidence of population expansion or decline:** None.
- g. **Cromwell Creek (009)**
1. **Area occupied by population:** ca. 1 acre.
  2. **Estimated number of individuals:** 10 plants observed in 1988.
  3. **Density:** Scattered.
  4. **Presence of dispersed seeds:** Unknown.
  5. **Evidence of reproduction:** Flowering plants observed.
  6. **Evidence of population expansion or decline:** None.
- h. **Hog Heaven Range**
1. **Area occupied by population:** ca. 1 acre.
  2. **Estimated number of individuals:** 12 plants in two subpopulations in 1988.
  3. **Density:** Scattered.
  4. **Presence of dispersed seeds:** Unknown.
  5. **Evidence of reproduction:** Flowering plants observed.
  6. **Evidence of population expansion or decline:** None.

C. **Phenology.**

1. **Patterns:** In Montana, the peak flowering period for S. spaldingii is during the third and fourth weeks in July. Depending on climatic conditions, flowers may open in early July, and on steeper north-facing slopes plants may extend their flowering period into early

August. Fruit and seed maturation occurs in August, with seed dispersal likely in late August or early September. Senescence of flowering stems was observed even as flowers were opening in the draughty 1988 field season. It is likely that the basal rosettes normally senesce as fruits and seeds mature. Seeds of this species may require cold stratification. germination (although further studies are needed), and germination is likely to occur in spring (Lesica, 1988); see Appendix C, p. 70.

2. **Relation to climate and microclimate:** Most of the known sites for S. spaldingii in Montana occur on north to east-facing slopes or draws, often near pine trees, where snow accumulations are likely to remain later into the spring. Silene spaldingii flowers in late July, and it is hypothesized that it is dependent on the extended moisture provided by the microclimate of these sites.

#### D. **Reproductive ecology.**

1. **Types of reproduction:** Silene spaldingii does not reproduce vegetatively; new individuals arise from seeds.
2. **Pollination.**
  - a. **Mechanisms:** Silene spaldingii is apparently dependent on insects for pollination. Results of pollination studies suggest that it is an obligate or near-obligate outcrossing species (Lesica, 1988); see Appendix D, p. 71.
  - b. **Specific known pollinators:** One known pollinator of S. spaldingii is the bumblebee (Bombus sp.), and there are likely to be others (Lesica, 1988); see Appendix D, p. 71.
  - c. **Other suspected pollinators:** Silene spaldingii has flowers characteristic of those pollinated by moths; however, none were ever documented as visitors (Peter Lesica, pers. comm.).
  - d. **Vulnerability of pollinators:** Bumblebees are relatively ubiquitous; however, overgrazing or pesticide use might be

locally detrimental to their populations (Lesica, 1988); see Appendix D, p. 71.

3. **Seed dispersal.**

- a. **General mechanisms:** *Silene spaldingii* has no apparent specialized mechanisms for long-distance seed dispersal. However, the seeds are very small and somewhat inflated, which might allow them to be easily dispersed by wind (Peter Lesica, pers. comm.).
- b. **Specific agents:** Possibly wind. The fruit develops holes through which seeds may be ejected when wind causes stem movement (Peter Lesica, pers. comm.).
- c. **Vulnerability of dispersal agents and mechanisms:** Unknown.
- d. **Patterns of propagule dispersal:** Unknown.

4. **Seed biology.**

- a. **Amount and variation of seed production:** Details unknown. Mature fruits appear to produce large numbers of seed (Lesica, 1988); see Appendix D, p. 71.
  - b. **Seed viability and longevity:** Unknown.
  - c. **Dormancy requirements:** Unknown.
  - d. **Germination requirements:** Seeds of *S. spaldingii* might require a period of cold stratification for germination (Lesica, 1988); see Appendix C, p. 70, for the results of this study.
  - e. **Percent germination:** Although the germination study emphasized cold stratification, the percentages given above indicate that most of the seeds produced are viable (Lesica, 1988); see Appendix C, p. 70.
5. **Seedling ecology:** Lesica (1988) found that seedlings began growth immediately, and after 60 days had rosettes with 6-14 leaves. These leaves then senesced, but after approximately 45 days most individuals put out new leaves.

It is hypothesized that this senescent period could correspond with the dry summer months; with new growth appearing in the fall after the onset of cool, moist weather, and a shortening of the photoperiod. See Appendix C, p. 70, for complete details of the study.

6. **Survival and mortality:** Populations of S. spaldingii, that in previous years were quite large, had declined in size range-wide in Montana according to monitoring studies (Lesica, 1988) and field surveys in 1988. This change in abundance is thought to be due at least in part to current drought conditions. See Appendices A and B, pp. 68 and 69, for more complete details.
  7. **Overall assessment of taxon's reproductive success:** Fluctuations in population sizes have been attributed to the prevailing drought conditions in Montana. No juvenile plants were observed in 1987; however, new adult plants were observed in 1988. It is possible that these plants were overlooked the first year, but it is more likely that the juvenile plants loose their leaves during the warm, dry summer months and are thus missed when the transects are read (Lesica, 1988). Silene spaldingii appears to have good reproductive potential where there is a stable native habitat, but it is likely to be affected by drought conditions.
8. **Population ecology of the taxon.**
- A. **General summary:** Silene spaldingii occurs on north-to east-facing slopes and draws, in rough fescue (Festuca scabrella) grasslands. Cover of grasses at these sites is generally quite high, and the species thus appears to tolerate competition and some shading. Much of the suitable habitat in the vicinity of the Niarada populations is on private land that has been heavily grazed. The result has been a conversion of native grasslands to vast tracts covered by stands composed of five or six exotic weedy species. No S. spaldingii populations were found in these areas. Thus it may be that grazing alters the native habitat so as to eliminate or prevent establishment of the species.
  - B. **Positive and neutral interactions:** None known.
  - C. **Negative interactions.**

1. **Herbivores, predators, pests, parasites and diseases:** Predation of flowers and fruits by caterpillars was observed during pollination studies, and is likely to be a source of seed loss (Lesica, 1988); see Appendix D, p. 71. Also, although not apparently directly grazed by cattle, populations of S. spaldingii appear to be influenced by them indirectly through the loss of native grasslands.
2. **Competition.**
  - a. **Intraspecific:** Individual plants of S. spaldingii appear to be widely distributed within populations, and there is no evidence of competition between plants.
  - b. **Interspecific:** Populations of S. spaldingii have not been found in otherwise suitable habitats where the native vegetation has been displaced by exotic weedy species. This species may be unable to compete with aggressive weedy species which have supplanted the native vegetation; alternatively, the lowered moisture content of the soils where the native grasses have been supplanted may hinder seed germination and establishment of S. spaldingii plants.

#### D. Hybridization.

1. **Naturally occurring:** This species has been described as an "unquestionably well-marked species" (Hitchcock *et al.*, 1964). However, several collections at sites in Oregon, on the edge of its range, have larger flowers and petal blades, and later flowering dates; overall, they appear more similar to S. oregana. There is the possibility that hybridization is occurring in these peripheral populations (Jimmy Kagan, Oregon Natural Heritage Program, pers. comm.).
2. **Artificially induced:** None known.
3. **Potential in cultivation:** Plants are currently being maintained in a greenhouse at the University of Montana, Missoula (Peter Lesica, pers. comm.).

E. Other factors of population ecology: None known.

9. Current land ownership and management responsibility.

A. General nature of ownership: State of Montana, Department of Fish, Wildlife and Parks; Confederated Salish and Kootenai Tribes; private land.

B. Specific landowners (Montana):

1. State of Montana  
Department of Fish, Wildlife and Parks  
1420 E. 6th Ave.  
Helena, MT 59620

2. Confederated Salish and Kootenai Tribes  
P.O. Box 278  
Pablo, MT 59855

3. Mr. Geiger  
Black Bear Ranch  
Niarada (Hot Springs), MT 59845

4. George Tripp  
Crosson Valley  
Niarada (Hot Springs), MT 59845

5. Elsie Brown  
Browns Meadow Rd.  
Niarada (Hot Springs), MT 59845

6. The Nature Conservancy  
Big Sky Field Office  
Power Block Building  
Box 258  
Helena, MT 59824

C. Management responsibility: Same as ownership given above.

D. Easements, conservation restrictions, etc.: The Black Bear Ranch (003) site is registered with The Nature Conservancy. A registered site does not have any legal protection; however, it does signify that the owner is aware of the rare element, and will notify The Nature Conservancy of any proposed alteration of the habitat, or existing management practices.

**10. Management practices and experience.**

**A. Habitat management.**

**1. Review of past management and land use experiences.**

**a.** The following sites in Montana incur some grazing during parts of the year:

Wild Horse Island (002) (002; horses)  
Black Bear Ranch (003)  
Mill Pocket Ridge (004)  
Crosson Valley (005)  
Tobacco Plains North (008)  
Cromwell Creek (009)  
Hog Heaven Range (010)

**b. Related taxa:** None known.

**c. Other ecologically similar taxa:** Not applicable.

**2. Performance under changed conditions:** Not applicable.

**3. Current management policies and actions:**  
Current management is the same as outlined under past management.

**4. Future land use:** Proposed areas for a new airport in the vicinity of Eureka are near the Dancing Prairie (001) site. When a final site is picked, a detailed inventory of the area should be conducted to determine if there are populations of S. spaldingii in the area, and to mitigate habitat destruction where possible.

**B. Cultivation.**

**1. Controlled propagation techniques:** Seeds of S. spaldingii are apparently easily germinated, and plants grow well under greenhouse conditions (Lesica, 1988); see Appendix C, p. 70.

**2. Ease of transplanting:** Not known.

**3. Pertinent horticultural knowledge:** Not reviewed.

4. **Status and location of presently cultivated material:** Plants are being maintained in the greenhouse at the University of Montana, Missoula (Peter Lesica, pers. comm.).

11. **Evidence of threats to survival.**

- A. **Present or threatened destruction, modification, or curtailment of habitat or range:** Silene spaldingii occupies habitats in Montana that are threatened by grazing. Pristine or near-pristine stands of Palouse prairie are easily lost to overgrazing and the resultant invasion of exotic weed species. In other states (Idaho, Oregon and Washington) most of the suitable habitat has been lost through conversion of lands to agriculture and to overgrazing. Much of the habitat where this species occurs in Montana is privately owned, and thus without use restrictions. Populations in these areas may be in danger of extirpation. Only a small portion of the habitat supporting the largest population (Dancing Prairie (001)) is secure (owned and managed by The Nature Conservancy, while the rest of the area is owned by private individuals).
- B. **Overutilization for commercial, sporting, scientific, or educational purposes:** No threats known.
- C. **Disease, predation, or grazing:** In Montana, only the Wild Horse Island site (002) is not threatened by overgrazing. All the other sites are lightly to heavily grazed. In conjunction with the extended drought, grazing may be even more detrimental to populations of Silene spaldingii.
- D. **Inadequacy of existing regulatory mechanisms:** None known.
- E. **Other natural or man-made factors:** None known.

II. ASSESSMENT AND RECOMMENDATIONS

12. **General assessment of vigor, trends, and status:** In Montana, Silene spaldingii is presently known from ten sites in Lincoln, Sanders and Flathead counties. Populations have declined over the past two years, probably owing to prevailing drought conditions. Populations may be in danger from livestock grazing.

13. Recommendations for listing or status change.

A. Recommendation to U.S. Fish and Wildlife Service:

On the basis of current information summarized in this status report, it is recommended that Silene spaldingii be retained in Category 2. Populations in Montana may be threatened by current grazing practices occurring on private lands. The current distribution, abundance and condition of populations in Oregon and Idaho is not well known. Although there are currently 15 known sites in Washington, population sizes are low and there are only approximately 448 plants in the state. Final status recommendations should be made upon completion of survey work in Idaho, Oregon and Washington. If substantial numbers of populations are not located in the other states, it should be placed in Category 1.

B. Recommendations to other U.S. federal agencies: In Montana Silene spaldingii is not currently found on federal lands.

C. Other status recommendations.

1. Counties and local areas: No recommendations.

2. States: Silene spaldingii is currently listed as S1 ("critically state endangered") in Montana, by the Montana Natural Heritage Program. No change in status is recommended.

3. Other nations: It is recommended that the Confederated Salish and Kootenai Tribes monitor the status of S. spaldingii populations on tribal lands. An evaluation of past and present grazing regimes, with subsequent adjustments, would aid in maintenance of populations and available habitat.

4. International: No recommendations.

14. Recommended critical habitat: The complete status of Silene spaldingii is not yet known in portions of its range. Thus, critical habitat is not being recommended at this time.

15. Conservation/recovery recommendations.

A. General conservation recommendations.

1. Recommendations regarding present or anticipated activities: The potential effects

of development (Eureka airport) and grazing pressures should be assessed before any of these activities are implemented.

2. **Areas recommended for protection:** Although currently registered with The Nature Conservancy, the Wild Horse Island site (002) should be nominated as a natural area, and should be given protection since, all other known sites are on private land.
  3. **Habitat management recommendations:** No recommendations are being made at this time.
  4. **Publicity sensitivity:** Low.
  5. **Other recommendations:** None.
- B. **Monitoring activities and research needs:** Ongoing demographic studies to monitor two populations of S. spaldingii were started, and the results to date are included in Appendices A and B, pp. 68 and 69. These studies should be continued indefinitely. Lesica (1988) suggests that this species is an obligate or near-obligate outcrosser. Further insect exclusion studies are needed to clarify these results (Lesica, 1988); see Appendix D, p. 71. Genetic and taxonomic studies might be helpful, to determine if this species is hybridizing at the edge of its range as theorized.
- Detailed field surveys are needed in Idaho, Oregon, and Washington to assess the status of populations and determine any threats to them.

**16. Interested parties:**

Office of Endangered Species  
ATTN: Dr. James Miller  
U.S. Fish and Wildlife Service  
P.O. Box 25486  
Denver Federal Center  
Denver, CO 80225

U.S. Fish and Wildlife Service  
ATTN: Carol Taylor  
Federal Building, 301 S. Park  
P.O. Box 10023  
Helena, MT 59626

Office of Endangered Species  
ATTN: Dr. John Fay  
U.S. Fish and Wildlife Service  
Washington, D.C. 20240

U.S. Forest Service, Region One  
ATTN: Angela Evenden  
Federal Building  
P.O. Box 7669  
Missoula, MT 59807

The Nature Conservancy  
ATTN: Dr. Larry Morse  
1815 North Lynn Street  
Arlington, VA 22209

The Nature Conservancy  
ATTN: Dr. Joan Bird and Bernie Hall  
Montana/Wyoming Field Office  
P.O. Box 258  
Helena, MT 59624

Confederated Salish & Kootenai Tribes  
Box 278  
Pablo, MT 59855

Montana Department of Fish Wildlife and Parks  
ATTN: Terry Knupp  
P.O. Box 67  
Kalispell, MT 59903

Montana Natural Heritage  
State Library Building  
1515 E. 6th Ave.  
Helena, MT 59620

Idaho Natural Heritage Program  
Department of Fish and Game  
600 S. Walnut Street, Box 25  
Boise, ID 83707

Oregon Natural Heritage Program  
1205 NW 25th Ave.  
Portland, Or 97210

Washington Natural Heritage Program  
Department of Natural Resources  
Mail Stop EX-13  
Olympia, WA 98504

British Columbia Rare Plant Program  
Botanical Garden  
The University of British Columbia  
6501 N.W. Marine Dr.  
Vancouver, B.C. V6T 1W5

### III. INFORMATION SOURCES

#### 17. Sources of Information.

##### A. Publications.

1. References cited in report: See Literature Cited (pp. 66-67).

2. Other publications/sources: None known.

B. Museum collections: Specimens from all but one Montana population are deposited at the University of Montana Herbarium in Missoula (MONTU). The following list of known herbarium specimens from Montana is organized by occurrence number:

001 - Lesica, P. (3541)

002 - Lesica, P. (2755)

003 - Lesica, P. (2766)

004 - Lesica, P. (2764)

005 - Lesica, P. (2767)

006 - Williams, R.S. (995)

007 - Lau, D. (74-63)

008 - Lesica, P. (3978)  
Schassberger, L.A. (249)

009 - Schassberger, L.A. (250)

##### C. Fieldwork.

###### 1. Surveys conducted:

21-29 July 1983, Lesica, P.  
16 July 1985, Lesica, P.  
17 July 1986, Lesica, P.

18-29 July 1988, Schassberger, L.A.

Areas surveyed included suitable habitat from the Tobacco Valley near the Canadian border, south to Arlee, Montana.

**D. Knowledgeable individuals:**

Bernie Hall  
The Nature Conservancy  
Montana/Wyoming Field Office  
Power Block Bldg.  
Box 258  
Helena, MT 59824

Peter Lesica  
Division of Biology  
University of Montana  
Missoula, MT 59812

Lisa A. Schassberger  
Montana Natural Heritage Program  
State Library Building  
1515 E. 6th Ave.  
Helena, MT 59620

J. Stephen Shelly  
Montana Natural Heritage Program  
State Library Building  
1515 E. 6th Ave.  
Helena, MT 59620

**E. Other information sources:** Color slides and field forms are on file at the office of the Montana Natural Heritage Program, and the Montana/Wyoming Field Office of The Nature Conservancy (see section II.16. for addresses).

**18. Summary of materials on file:** All detailed field forms, maps and color slides are on file at the office of the Montana Natural Heritage Program. Herbarium vouchers for Montana populations are deposited at the University of Montana Herbarium (MONTU).

**IV. AUTHORSHIP**

**19. Initial authorship:**

Lisa A. Schassberger  
Montana Natural Heritage Program  
State Library Building  
1515 E. 6th Ave  
Helena, MT 59620  
Phone: 406-444-3009

20. **Maintenance of status report:** The Montana Natural Heritage Program will maintain current information and update the status report as needed. Should the taxon be listed as an endangered or threatened species by the U.S. Fish and Wildlife Service, the Service, through its Office of Endangered Species (Region 6), should maintain the primary file of information, encourage others to provide new information, and distribute new findings, as received, to the interested parties (section II.16.).

V. NEW INFORMATION

21. **Record of revisions:** Not currently applicable.

### Literature Cited

- Alt, D. and D.W. Hyndman. 1986. Roadside Geology of Montana. Mountain Press Pub. Co., Missoula, Montana. 427pp.
- Dorn, R.D. 1984. Vascular Plants of Montana. Mountain West Pub., Cheyenne, Wyoming. 276 pp.
- Heidel, B. 1980. Unpublished report on the status of Silene spaldingii. 10 pp.
- Hitchcock, C.L., Cronquist, A., Ownbey, M., and J.W. Thompson. 1964. Vascular Plants of the Pacific Northwest. Univ. of Washington Press, Seattle, Washington.
- Hitchcock, C.L., and B. Maguire. 1947. A Revision of the North American species of Silene. U. of Washington Pub. 13: 28.
- Hunt, C.B. 1974. Natural Regions of the United States and Canada. W.H. Freeman and Co., San Francisco, California. 725 pp.
- Kuchler, A.W. 1964. Potential Natural Vegetation of the Conterminous United States. American Geographical Society, New York, New York.
- Lesica, P., Moore, G., Peterson, D.M., and J.H. Rumely. 1984. Vascular Plants of Limited Distribution in Montana. Monograph No. 2, Montana Acad. Sci., Supplement to the Proceedings, Vol. 43. 61 pp.
- Mueggler, W.F., and W.L. Stewart 1980. Grassland and shrubland habitat types of western Montana. USDA Forest Service Technical Report INT-66, Ogden, Utah. 154 pp.
- Ross, R.L., and H.E. Hunter 1976. Climax vegetation of Montana based on soils and climate. USDA Soil Conservation Service, Bozeman, Montana. 64 pp.
- Shelly, J.S. 1988. Plant species of special concern. Montana Natural Heritage Program, Helena. 12 pp., mimeo.
- Siddall, J.L., Chambers, K.L., and D.H. Wagner. 1979. Rare, Threatened and Endangered Vascular Plants in Oregon, An Interim Report. Division of State Lands, Salem, Oregon. 109 pp.
- U.S. Department of Agriculture, Forest Service. 1981. Vascular Plant Species of Concern in Idaho. Univ. Idaho, FWR Experiment Station, Moscow, Idaho. Bull. No. 34. 161pp.

- U.S. Department of Agriculture, Forest Service. 1988. Sensitive Plant Species List for Region 4 in Sensitive Plant Program Handbook. p. 5.3.3-5.5.10.
- U.S. Department of Commerce 1982. Monthly normals of temperature, precipitation, and heating and cooling degree days, 1951-1980, Montana. National Oceanic and Atmospheric Administration, Climatology of the United States No. 81. 23 pp.
- U.S. Department of Interior, Fish and Wildlife Service 1985. Endangered and threatened wildlife and plants: review of plant taxa for listing as endangered or threatened species. Federal Register 50 (188): 39526-39584.
- Visher, S.S. 1954. Climatic Atlas of the United States. Harvard Univ. Press, Cambridge Mass. 403 pp.
- Watson, S. 1875. Revision of the genus Ceanothus, and descriptions of new plants, with a synopsis of the western species of Silene. Proc. Am. Acad. 10: 333-350.

**APPENDIX A.**

**MONITORING SILENE SPALDINGII ON  
WILD HORSE ISLAND: 1988 PROGRESS REPORT**

**Introduction and Methods**

On August 18, 1986, two permanent transects were established on Wild Horse Island in order to monitor a population of Silene spaldingii and begin to gather data on the life history of this rare plant (see Lesica, 1986 for details on the location of the transects). On August 2, 1988, Bernie Hall and I reread these transects following methods outlined in Lesica (1987). Codes used in recording life history data are as follows:

S	Seedling	Only a basal rosette present
J	Juvenile	A non-reproductive individual with only sterile stems
I	Inflorescence	Records the number of flowering stems per mature individual
S	Sterile	Records the number of sterile stems per mature individual
P	Predated	Records the number of flowers suffering predation
A	Aborted	Records the number of unpredated flowers that did not produce a mature fruit
F	Fruit	Records the number of flowers that produced a mature fruit recognized by the presence of a large, swollen ovary

**Results and Discussion**

Fecundity data for the two years are presented in Table 1. The number of plants in the transects decreased by 1/3 from 1986 to 1988. In addition, the total number of flowers and fruits produced also declined dramatically. Part of this decline is due to the presence of fewer mature plants, and part is due to a decrease in the number of flowers produced by individual plants. The mean rate of abortion stayed approximately the same.

A comparison of individual plant performance between the two years are presented in Table 2. Thirteen plants present in 1986 could not be located in 1988, and four plants not recorded in 1986 were present in 1988. As measured by flower and fruit production, all plants decreased in vigor.

Much of the decline in plant vigor indicated by these

results can probably be attributed to the dry 1987 fall, and hot dry conditions during the summer of 1988. The loss of 13 individuals from the transects is reason for concern if these plants have actually died; however, it is possible that above ground parts senesced and were blown away by the wind before the transects were read. The four new plants may be the result of recruitment, or may be individuals that were missed when the transects were read in 1986. Seedlings could have been missed if rosette leaves senesce in early or mid-summer; perhaps before the transects were read. Continued monitoring will help answer these questions.

#### Literature Cited

- Lesica, P. 1986. Monitoring of a population of the rare plant Silene spaldingii on Wild Horse Island. Report prepared for The Nature Conservancy, Helena, MT.
- Lesica, P. 1987. A technique for monitoring nonrhizomatous perennial plant species in permanent belt transects. Natural Areas Journal 7: 65-68.

Prepared by: Peter Lesica  
The Nature Conservancy  
Montana/Wyoming Office  
Box 258  
Helena, MT 59624  
September, 1988

Table 1. Summary of fecundity data for Silene spaldingii in the Wild Horse Island monitoring transects in 1986 and 1988.

	1986	1988
Total number of plants	23	14
Number of non-reproductive plants	0	7
Number of seedlings	0	0
Total number of unpredated flowers	145	19
Total number of fruits	78	0
Mean number fruits/mature plant	3.4	0
Mean number predated flowers/mature plant	1.4	0.1
Mean number aborted flowers/mature plant	2.9	2.7
Mean number of flowers/mature plant	6.5	2.9

Table 2. Performance of individual Silene spaldingii plants in the monitoring transects between 1986 and 1988.

Transect 1

Plot	1986	1988
2	I1-F6-A8	I1-A3
16	I1-F1	I1-A3
17	I2-P6	I1-A3
18	----	I1-A3
34	I2-F1-A6	J
35	I1-F1-A4	----
41	I1-F2-A2	----
45	I1-F15	----
48	I1-F9-A5	J
49	I2-F5-A1	----
50	I1-F2-A3	J

Transect 2

2	I2-F5-A5	J
26	I1-F5-A7	----
27	I1-F7-A3	----
28	I2-P2	----
30	I1-F3-A2	----
31	I1-F2-A6	----
32	----	I1-A3
32	I1-F2-A4	J
34	----	I1-A2
35	I1-F1	I1-P1-A2
36	I1-F4-A1	----
36	----	J
41	I2-F3-A6	----
44	I1-F2-A2	J
45	I1-F2-A2	----
46	I1-P1	----

**APPENDIX B.**

**MONITORING SILENE SPALDINGII ON  
DANCING PRAIRIE PRESERVE: 1988 PROGRESS REPORT**

**Introduction and Methods**

On July 23, 1987 four permanent transects were established on the proposed Dancing Prairie Preserve in order to monitor a population of Silene spaldingii and begin to gather data on the life history of this rare plant. On August 1, 1988, Bernie Hall and I reread these transects following the methods outlined in Lesica (1987). Codes used in recording life history data are as follows:

S	Seedling	Only a basal rosette present
J	Juvenile	A non-reproductive individual with only sterile stems
I	Inflorescence	Records the number of flowering stems per mature individual
S	Sterile	Records the number of sterile stems per mature individual
P	Predated	Records the number of flowers suffering predation
A	Aborted	Records the number of unpredated flowers that did not produce a mature fruit
F	Fruit	Records the number of flowers that produced a mature fruit recognized by the presence of a large, swollen ovary

**Results and Discussion**

Fecundity data for the two years are presented in Table 1. The number of plants in the transects decreased by nearly 1/2 from 1987 to 1988. In addition the total number of flowers and fruits produced declined by nearly an order of magnitude. Part of this decline is due to the presence of fewer mature plants, and part is due to a decrease in the number of mature fruit produced per mature plant. The mean number of flowers per mature plant stayed approximately the same.

A comparison of individual plant performance between the two years are presented in Table 2. Twenty-seven plants present in 1987 could not be located in 1988, and nine plants not recorded in 1987 were present in 1988. As measured by flower and fruit production, nearly all the plants declined in vigor.

Much of the decline in plant vigor indicated by these results can probably be attributed to the dry 1987 fall, and hot,

dry conditions during the summer of 1988. The loss of 27 individuals from the transects is reason for concern if these plants have actually died; however, it is possible that above-ground parts senesced and were blown away by the wind before the transects were read. The nine new plants may be the result of recruitment, or may be individuals that were missed when the transects were read in 1986. Seedlings could have been missed if the rosette leaves senesced in early or late summer; perhaps before the transects were read. Continued monitoring will help answer these questions.

#### Literature Cited

Lesica, P. 1987. A technique for monitoring nonrhizomatous perennial plant species in permanent belt transects. Natural Areas Journal 7: 65-68.

Prepared by: Peter Lesica  
The Nature Conservancy  
Montana/Wyoming Office  
Box 258  
Helena, MT 59624  
September, 1988

Table 1. Summary of fecundity data for Silene spaldingii in the Dancing Prairie monitoring transects in 1987 and 1988.

	1987	1988
Total number of plants	37	19
Number of non-reproductive plants	4	11
Number of seedlings	2(?)	0
Total number of unpredated flowers	226	37
Total number of fruits	212	21
Mean number fruits/mature plant	6.4	2.6
Mean number predicated flowers/mature plant	0	0.6
Mean number aborted flowers/mature plant	0.2	2.6
Mean number flowers/mature plant	6.8	5.2

Table 2. Performance of individual Silene spaldingii plants in the monitoring transects between 1987 and 1988.

	Transect 1	
10	I1-F4	----
14	I1-F12	----
29	I1-A3	----
31	J	----
33	I1-F12	----
37	I1-F2	----
44	S(?)	---?
45	I1-F7	I1-A5
47	I1-F5	----

	Transect 2	
1	----	J
5	----	J
7	I1-F3	----
8	----	J
10	----	J
41	I1-F3	----
41	I1-F10	----
42	J	----
45	I1-F1	I1-P3
46	I1-F6	----
46	----	I1-A1
47	J	J
47	---	I1-A3-F2
48	I1-F3	J
48	I1-F1	----
49	I1-F10	J
50	I1-F5	----

## Transect 3

1	I1-F4	J
5	I1-F5	----
10	I1-F5	----
15	I1-F8	----
15	I1-A3	----
16	J	----
23	I1-F8	J
26	I1-F22	----
26	I1-F3	----
27	I1-F12	I1-P3
30	----	J
37	S(?)	---?

## Transect 4

5	I1-F11	----
9	J	----
10	I1-F5	J
16	I1-F6	----
18	I1-A2	----
23	I1-F5	----
23	I1-F12	----
24	----	I1-A7-P1-F8
31	----	I1-P2-F3
40	I2-F22	I2-A5-P1-F8

**APPENDIX C.**

## Germination Requirements and Seedling Biology of Spalding's Catchfly (Silene spaldingii)

In order to properly manage for the continued existence of a rare plant, it is essential to understand the entire life history of the species. The objectives of this study were to determine the germination requirements and seedling life history of Spalding's catchfly (Silene spaldingii).

### Methods

I collected seed from populations of Spalding's catchfly at Wild Horse Island in Lake County and the Tobacco Valley in Lincoln County, Montana. Seed was taken from ripe fruits, dried in paper envelopes and stored at room temperature. I sterilized seeds in a solution of 20% laundry bleach for 15 minutes, rinsed them thoroughly in distilled water and placed them on saturated filter paper in petri dishes. Each petri dish contained 50-100 seeds. Two dishes were placed in the dark in a refrigerator at ca. 3 C, and two dishes were kept at room temperature with a 10-hour light regime. After 30 days I took the dishes from the refrigerator and kept them at room temperature for five days. At the end of this time I counted the germinated seeds and estimated percent germination in all the dishes.

I placed germinated seeds in small pots of garden soil and raised the seedlings in the University of Montana, Botany greenhouse. Potted plants were placed in the greenhouse in late January, watered at regular intervals and observed through September of the same year.

### Results and Discussion

Less than 5% of the Silene seed in the room temperature treatment had germinated at the end of the 35-day period, while 60-70% germination was achieved with the 30-day cold stratification treatment. These results suggest that Spalding's catchfly requires cold stratification for germination, and under normal circumstances would germinate in early spring.

Seedlings began growth immediately, and within 30 days most rosettes had 4-6 leaves. At 60 days most rosettes had 6-14 leaves. After this two-month period, the rosettes ceased to grow. The leaves remained green for another 60 days, and then the rosettes senesced. After approximately 45 days many of the senesced individuals put out new leaves. This occurred in late September after the weather had cooled. Results of this study suggest that, under field conditions, seedlings of Spalding's catchfly germinate in the spring and grow while the soil is moist and the weather is relatively cool. Plants are senescent during the warm, dry, summer months and then revive with the onset of

cool, moist weather and/or with a change in photoperiod in the early fall.

The results of these studies may explain why seedlings of Spalding's catchfly have never been detected in the permanent monitoring transects on Wild Horse Island and at Dancing Prairie when they have been read in late July or early August. Young plants may spend the summer months hidden underground. These results also suggest that if fire is to be used as a management tool, burning during the summer months would have the least impact on seedlings of Spalding's catchfly.

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October, 1988

**APPENDIX D.**

**A Preliminary Study of the Pollination  
Biology of Spalding's Catchfly in the Tobacco Valley,  
Lincoln County, Montana**

**INTRODUCTION**

Conservation of rare species is one of the principle goals of The Nature Conservancy. Frequently, this requires more than simply protecting populations of a species. In the case of plants that are obligate outcrossers, it is also necessary to protect or enhance the habitat of the plant's pollinators in order to ensure continued recruitment.

Spalding's catchfly (Silene spaldingii Wats.) is a perennial herb that is potentially threatened or endangered throughout its range in the Pacific Northwest. It does not reproduce vegetatively; all new individuals must start from seed. It occurs in relatively pristine bunchgrass grasslands in the Palouse Region of eastern Washington, northeastern Oregon, adjacent Idaho and northwestern Montana (Heidel 1980, Lesica, field observations). Flowers of Spalding's catchfly are relatively large (ca. 2 cm long) and inconspicuously colored with white petals that are mostly enclosed by the green, broadly cylindrical calyx. At anthesis the flowers are presented horizontally in an open cyme. These characteristics suggest that Spalding's catchfly is adapted for pollination by bees or hovering moths (Faegri and van der Pijl 1971); however, the pollinators of this species are not currently known. In addition, it is not known to what extent Spalding's catchfly is capable of self-fertilization.

The purpose of this study is to determine the pollinators of Spalding's catchfly on The Nature Conservancy's proposed Dancing Prairie Preserve in northwestern Montana and to discover the extent to which this species is capable of setting seed in the absence of pollinators.

**METHODS**

I observed pollinators of Spalding's catchfly at the proposed Dancing Prairie Preserve in northeastern Lincoln County, Montana on July 12-14, 1988. I spent a total of 28 hours watching a large patch (ca. 30 plants) of Spalding's catchfly in the north-central area of section 26. Part of this time was also spent making observations at other patches in the area. Since many moth pollinators are crepuscular, on all three days I made observations during the early mornings and at dusk. Weather during this three-day period was cold, rainy and windy.

In order to determine whether Spalding's catchfly can set seed in the absence of pollinators, I excluded insects from the inflorescences of 21 plants in four colonies in the north-central area of section 26. For each experimental plant, I removed all flowers that had already opened as well as all insect predators that I detected. I then placed a fine-mesh nylon bag around the inflorescence and tied it closed at the base. These bags allow flowers to open and develop in partial sunlight while excluding any insects larger than 1 mm wide. Plants were bagged on July 14, 1988. Seventeen days later on August 1, I collected the bagged inflorescences

and recorded the total number of flowers, the number that had been predated and the number that had matured fruit. I recognized mature fruit by the presence of a large, swollen ovary. I collected this same information for 25 randomly selected controls (unbagged plants) growing in the same area. Inflorescences of both the bagged plants and the controls were placed in paper bags to allow complete ripening of fruit and an estimation of seed production. I dissected and examined flowers at different stages after anthesis in order to determine the relative ripening times of anthers and stigmata.

On numerous occasions during the course of the study I observed caterpillars (presumably lepidopteran larvae) feeding on the flowers of Spalding's catchfly. These 2 cm-long larvae enter the base of a flower and consume the ovary and other flower parts and then move to another flower on the same inflorescence. I believe that these larvae are responsible for most or all of the flower predation recorded in this study. I attempted to remove all of these predators from the experimental plants at the beginning of the study.

#### RESULTS AND DISCUSSION

Presumably due to the inclement weather, I observed only three pollination episodes during the three days of the study. On these occasions I observed bumblebees (Bombus sp.) sequentially enter the flowers of at least three plants of Spalding's catchfly. I did not observe any other flying insects visiting the flowers. I collected one of these bees and returned it to the laboratory. Pollen collected from the body of this bee matched well with pollen taken from herbarium specimens of Spalding's catchfly. These results suggest that bumblebees can be effective pollinators of Spalding's catchfly. Further studies during periods of good weather are needed to confirm and extend these results.

Examination of numerous flowers indicates that Spalding's catchfly is protandrous. Anthers mature and dehisce pollen first. After which the styles expand in length, and the stigmas spread apart and become receptive.

The nylon mesh bags of seven of the 21 experimental plants were chewed open during the course of the study. I found the exoskeleton of a grasshopper in one of the opened bags, and I suspect that they were responsible for the damage. Since the inflorescences of these plants were open to pollinators for part of the experiment, they have not been included in the following analyses.

Fruit production data for the remaining 14 experimental plants and the 25 controls are presented in Table 1. There were a total of 161 flowers on the 25 control plants. Of these, 40 (25%) were lost to predation. Of the remaining 121 flowers, 91 (75%) produced mature fruit. There were a total of 77 flowers produced by the experimental plants. Of these, 3 (4%) were lost to predation. Of the remaining 74 flowers, 12 (17%) developed mature fruits. Only one or two of the "mature" fruits collected from the experimental plants actually contained ripened seed after they had been stored in a paper bag for 1 month. Mature fruits from control plants contained copious seed. These results suggest that Spalding's catchfly is

an obligate or near-obligate outcrosser; however, I feel that an expanded study specifically examining seed set of bagged plants is necessary to confirm these results.

The results of this study suggest that Spalding's catchfly is an obligate or near-obligate outcrossing species capable of being pollinated by bumblebees. Although bumblebees are common and ubiquitous, overgrazing by livestock can have a detrimental effect on bee populations and consequently on the reproductive effort of the plants they pollinate (Sugden 1985). In the absence of severe overgrazing and pesticide use, seed production by Spalding's catchfly will probably not be curtailed by pollinator limitation.

#### **LITERATURE CITED**

- Faegri, K. and L. van der Pijl. 1971. The principle of pollination ecology. Pergamon Press, Oxford.
- Heidel, B. 1980. Report on the conservation status of Silene spaldingii. Report prepared for the U.S. Fish and Wildlife Service, Office of Endangered Species, Portland, OR.
- Sugden, E. A. 1985. Pollinators of Astragalus monoensis Barneby (Fabaceae): new host records; potential impact of sheep grazing. Great Basin Naturalist 45: 299-312.

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Table 1. Fruit maturation for bagged and control plants of Spalding's catchfly. The fourth column is the percent of unpredated flowers that developed into fruit.

# flowers aborted	# flowers predated	# mature fruit	# Mature fruit/ # unpredated flowers
CONTROL PLANTS			
1	2	2	67
0	3	2	100
0	3	3	100
1	6	5	83
2	2	4	67
2	0	4	100
0	1	9	100
3	1	0	0
0	0	5	100
0	0	8	100
0	1	4	100
2	0	2	50
1	2	0	0
0	0	7	100
1	0	5	83
4	0	5	56
1	1	3	75
2	0	2	50
3	6	4	57
0	1	4	100
0	1	2	100
2	0	1	33
4	2	6	75
0	6	1	100
1	2	3	75
BAGGED PLANTS			
3	0	3	50
4	1	0	0
3	1	2	40
7	0	0	0
3	1	0	0
3	0	2	40
6	0	1	14
5	0	0	0
3	0	1	25
6	0	0	0
5	0	0	0
3	0	0	0
6	0	3	33
5	0	0	0

Table 2. Fruit set and flower predation of fruits for bagged and control plants of Spalding's catchfly.

	<u>Bagged</u>	<u>Control</u>
Total number of flowers	77	161
Number of predated flowers	3 (4%)	40 (25%)
Number of flowers producing fruit	12	91
% unpredated flowers producing fruit	17%	75%

DISTRIBUTION LIST

Report Title: Silene spaldingii DEC. 1988

date	recipient
1988	USFWS - Denver
	" Helena
1999-5-3	Lolo N.F.
13 Aug 91	Stewardship intern - MT FO
15 July 92	Wretta Dozier, Div. of Endangered Species
	USFWS, Ft. Snelling, Twin Cities, MN 55111

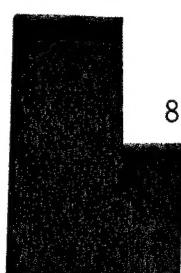
Silene spaldingii 7/1985



Silene spaldingii 7/1983



Silene spald

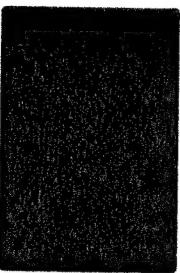


8

Wild Horse Island (002)  
State Park

Dancing Prairie  
Tobacco Plains S.  
(001)

Silene spaldingii 7/1986

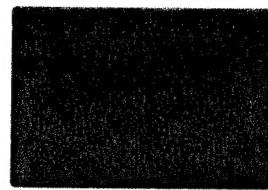


Lisa A. Schlossberger

Tobacco Plains North (008)

Silene spaldingii 7/1986

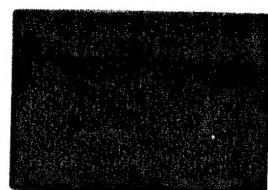
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Dancing Prairie  
Tobacco Plains S. (001)

Silene spaldingii 7/1988

Habitat

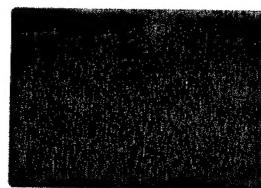


Tobacco Plains  
North (008)

Lisa A. Schlossberger

Silene spaldingii 7/1983

Habitat

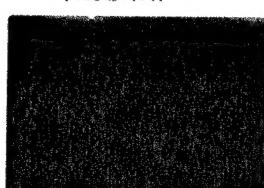


Peter Lesica

Mill Pocket Ridge (004)

Silene spaldingii 7/1983

Habitat

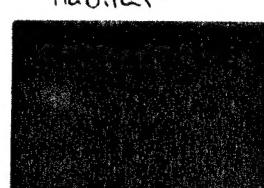


Peter Lesica

Crosson Valley (005)

Silene spaldingii 7/1988

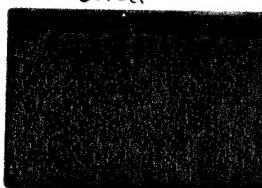
Habitat



Lisa A. Schlossberger

Silene spaldingii 7/1983

Habitat



Peter Lesica

Crosson Valley (005)

## ELEMENT OCCURRENCE RECORD

EOCODE: PDCAROU150.008  
NAME: SILENE SPALDINGII  
COMNAME: SPALDING CAMPION  
MARGNUM: 10 TENTEN: 4,2 IDENT: Y EORANK: B  
SURVEYSITE: TOBACCO PLAINS NORTH  
EORANKCOMM: 1988, DRY YEAR - POPULATION MAY BE LARGER  
SURVEYDATE: 1986-07-17 LASTOBS: 1988-07-18 FIRSTOBS: 1986 GRANK: G2  
SRANK: S1 STATE: MT COUNTYNAME: MTLINC  
QUADCODE: 4811581  
QUADNAME: EUREKA NORTH PRECISION: SC  
LAT: 485928 LONG: 1150454 S: 485926 N: 485930 E: 1150445 W: 1150501  
TOWNRANGE: 037N027W SECTION: 11 MERIDIAN: PR TRSCOMM: NW4  
  
PHYSPROV: NR WATERSHED: 17010101 RIVERREACH:  
DIRECTIONS: TOBACCO PLAINS, ABOUT 8 MILES N.OF EUREKA. NORTHERN POP-  
ULATION NORTH OF ROAD EXTENDING UP TO AND OVER CANADIAN  
BORDER.  
GENDESC: IN GRASSLANDS ON LOW, NORTH-FACING SLOPES; WITH FESTUCA  
IDAHOENSIS, FESTUCA SCABRELLA.  
  
ELEV: 2700 SIZE: 3  
EODATA: LOCALLY COMMON. 2ND SUBPOPULATION WITH 6 PLANTS, FLOWERING  
IN 1988.

COMMENTS: NONE.

MACODE1: PRIVATEOWNMTUS CONTAINED1: MACODE2: CONTAINED2:  
MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:  
MOREMGMT: Z SITECODE:  
SITENAME:  
OWNER:  
OWNERCOMM:  
PROTCOMM:  
MGMTCOMM:  
MONITOR: MONITORNUM:  
BESTSOURCE: LESICA, P. (3978). 1986. SPECIMEN #104445 UM. SCHASSBERGER  
L.A. 1988. SPECIMEN # 249 MONTU.  
SOURCECODE: S86LESUMMTUS PNDLES01MTUS F88SCH06MTUS PNDSCH02MTUS S88SCHUMMTUS  
  
DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:  
TRANSCRIBR: 87-08-17 JEG CDREV: Y MAPPER: 87-08-19 JEG QC: Y  
UPDATE: 88-12-02 LAS

## ELEMENT OCCURRENCE RECORD

EPCODE: PDCAROU1S0.009  
NAME: SILENE SPALDINGII  
COMNAME: SPALDING CAMPION  
MARGNUM: 2 TENTEN: 8,10 IDENT: Y EORANK: C  
SURVEYSITE: CROMWELL CREEK  
EORANKCOMM: HEAVILY GRAZED PASTURE  
SURVEYDATE: 1988-07-22 LASTOBS: 1988-07-22 FIRSTOBS: 1988 GRANK: G2  
SRANK: S1 STATE: MT COUNTYNAME: MTFLAT  
QUADCODE: 4711485  
QUADNAME: KOFFORD RIDGE PRECISION: SC  
LAT: 475233 LONG: 1143056 S: 0 N: 0 E: 0 W: 0  
TOWNRANGE: 025N023W SECTION: 35 MERIDIAN: PR TRSCOMM: SE4  
PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 1701021206400.00  
DIRECTIONS: CA. 4.1 AIR MILES NE OF NIARADA; TRAVEL CA. 4.3 MILES N OF  
HIGHWAY 28 ON CROMWELL CREEK ROAD, SE OF ROAD ON HILLSIDE  
JUST BELOW TREELINE.  
GENDESC: PROTECTED DRAW ON SLOPE IN GRAVELLY SILT LOAM WITH FESTUCA  
SCABRELLA AND ROSA spp.  
ELEV: 3420 SIZE: 1  
EODATA: 10 PLANTS FLOWERING, BUT DRYING OUT FROM THE BOTTOM UP.

COMMENTS: VOUCHER - SCHASSBERGER, L.A. (250), 1988, MONTU.

MACODE1: PRIVATEOWNMTUS CONTAINED1: Y MACODE2: CONTAINED2:  
MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:  
MOREMGMT: Z SITECODE:  
SITENAME:  
OWNER: ELSIE BROWN  
OWNERCOMM:  
PROTCOMM:  
MGMTCOMM:  
MONITOR: MONITORNUM:  
BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN LAKE, SANDERS,  
FLATHEAD AND LINCOLN COUNTIES OF 18-29 JULY.  
SOURCECODE: F88SCH06MTUS PNDSCH02MTUS S88SCHUMMTUS  
DATASENS: BOUNDARIES: Y PHOTOS: Y OWNERINFO:  
TRANSCRIBR: 88-08-04 LAS CDREV: Y MAPPER: 88-08-04 LAS QC: Y  
UPDATE: 88-08-18 MEZ

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>043 n-us-mt  
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>100 10 Roe, Lisa Schassberger.  
>245 1 Report on the conservation status of *Silene spaldingii*, a candidate threatened species / Lisa Ann Schossberger.  
>260 Helena, Mont. : Montana Natural Heritage Program [1988].  
>300 71 leaves : ill., maps ; 28 cm.  
>500 Abridged  
>500 Cover title  
>500 "22 December, 1988".  
>504 Includes bibliographical references (leaves 66-67).  
>650 0 Botany--Montana.  
>650 0 Rare plants--Montana.  
>650 0 *Silene spaldingii*--Montana.  
>710 20 Montana Natural Heritage Program.

5  
583.152  
N17 ssrC  
1988

Suppress pp. 19-25